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An Overview of the Prehistoric Resources of the Metropolitan St. Louis Area

National Park Service
U.S. Department
of the Interior
Washington, 1976

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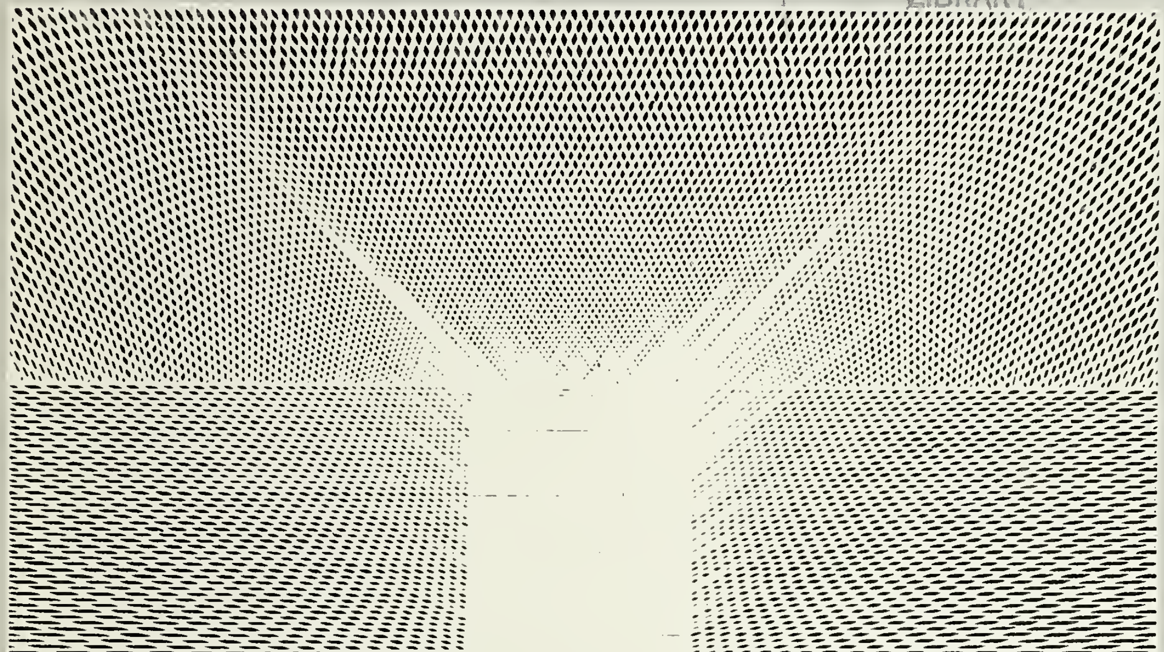

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Cultural Resource Management Studies

An Overview of the Prehistoric Resources of the Metropolitan St. Louis Area

Elizabeth Benchley

U.S. Department of the Interior National Park Service Washington, 1976

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Elizabeth Benchley
15 July 1975
Milwaukee, Wisconsin

INTRODUCTION

Archaeological resources form an important part of America's heritage since they often provide the only remaining records of the events and processes which created the present. The great value of archaeological resources lies in the wealth of potential information they can provide about both the specific developments in the historic and prehistoric past and the general cultural processes which continue to operate in the present. In addition to contributing to the historical perspective which is necessary for interpreting the present and projecting the future, the analysis of archaeological data allows scientists to formulate and test generalizations regarding problems such as the interaction between man and his environment, the significance of cultural diversity, and the evolution of human societal forms. If archaeological resources continue to be destroyed at the present alarming rate, we will have lost not only the tangible evidences and monuments of our past, but also the potential information they hold for providing insights into present and future problems.

Archaeological sites are locations consisting of the physical remains of human activity which took place in the past. The most valuable aspect of the information they provide lies in the context of the remains, not in the artifacts themselves. The context of archaeological data includes both the location and associations of materials within a site and the associations of a site with respect to surrounding natural resources and contemporary human settlements. It is the complex interrelationship among these many data classes that provides the most useful information for interpreting past events and processes.

Archaeologists investigate archaeological resources in the search for answers to a variety of questions. They are concerned initially with clarifying the timing and sequence of cultural developments and changes. But in addition to temporal concerns, archaeologists presently are trying to answer questions regarding man's relationships with his natural and social environments, the dynamics of cultural stability and change, the distributions of human groups across the landscape, and the evolution of cultural forms. As in every science the kinds of questions that archaeologists are able to ask and answer change through time with the development of new technology, theory, and data. The kinds of information archaeologists are currently extracting from archaeological sites will invariably be inadequate for answering the questions of the future. In order to insure that there are meaningful data available to future generations, it will be necessary to begin management programs for conserving the resource base which remains.

Archaeological resources are both fragile and nonrenewable. Because they most often occur near the present ground surface, archaeological sites are easily destroyed by modern land use practices. And because it is the context of the data which is important, once a site has been disturbed by land use, relic collectors, or scientific investigation, the resource cannot be replaced or recreated. The need for archaeological resource management programs increases steadily as archaeological sites are threatened and destroyed by expanding urban areas, transportation networks, agricultural and mining industries, and recreation zones.

An effective management program should focus on conserving archaeological resources including the preservation, stabilization, restoration, and interpretation of archaeological sites and data. Ideally a regional management program should be geared toward the conservation of two categories of cultural resources, those which are unique to an area, and those which are representative of an area. Unique resources either never existed in other areas or no longer exist elsewhere and conservation efforts should attempt to preserve as much as possible of these resources. Representative resources may be found in other regions as well, but since they form a part of the prehistoric record of an area and have the potential of revealing unique as well as representative data, an adequate sample of the resources should be preserved.

There are several kinds of tools currently available for promoting the management of archaeological resources. The first and probably most effective tool is education. By increasing the public's awareness, concern, and appreciation for its national and local heritage, all other attempts at preserving archaeological resources will be enhanced.

A second management tool is existing legislation designed to protect cultural resources. Federal laws such as the National Historic Preservation Act of 1966, the National Environmental Policy Act, Executive Order 11593 and the Archaeological and Historic Preservation Act clearly establish a national policy of concern and action on behalf of evaluating and preserving cultural, historical, and archaeological resources. The application of these laws to all relevant situations will go far in assuring there is a cultural resource base left to manage.

The third management tool is planning. Effective archaeological resource management can only be accomplished through regional planning efforts. Planning involves initially developing a general overview of the archaeology of a region for identifying important resources and the factors affecting them. Following the overview study, planning efforts should focus on developing an integrated program involving data collection, plan (and alternative plan) formulation, and implementation.

The St. Louis Metropolitan Area has been selected as the location for an overview study of the archaeological resources for several reasons. It is an area with an increasing population and physically expanding urban centers surrounded by zones which include intensive agriculture, mining, transportation routes and vacant land. The St. Louis area thus presents a range of land use types whose proportions and intensities are rapidly changing.

The St. Louis area is also the location of extremely important archaeological resources. Around A.D. 1000 the area formed the center of development for what appears to be the only prehistoric political state north of central Mexico, and across the Mississippi River from St. Louis lie the remains of the only urban center in the United States which dates to before the era of European influence. A variety of earlier and later archaeological sites are also known from the St. Louis area. It is the prehistoric archaeological resources of the St. Louis area relating to the cultural systems of the American Indian which are the subject of this overview study.

The archaeological resource overview of the St. Louis area consists of several parts. Initially the physical attributes of the area are described in order to provide a setting for the description of both the prehistoric and modern cultural resources. A discussion of the archaeology of the larger region around St. Louis follows in order to provide a framework for evaluating the archaeological resources of the St. Louis area. Priorities of archaeological resource significance are established on the basis of this regional perspective.

It should be noted that the priorities do not conform to the ideal of preserving a sample of all archaeological resource types in a region. Because of the immediate threat posed by the expanding urban area, the priorities focus on resources which are likely to contain well preserved data. The priorities are also not intended to suggest that scientific investigation of other archaeological problems, periods, and sites in the area is unwarranted. Archaeological priorities established in the study relate to the threat of destruction and the need for resource management in the face of the pressures of modern land use trends.

The description of the archaeological resources of the St. Louis area examines the quality of the available data, the temporal and physical distributions of known archaeological resources, the projected resource base, and the amount of the known resource base which appears to have been destroyed. An examination of the present and projected land use in the St. Louis area provides the basis for delimiting expected zones of high impact on the known and projected archaeological resources. Finally, recommendations are presented on measures which should be taken in order to insure the wise management and preservation of the archaeological resource base in the St. Louis area.

PHYSICAL SETTING

LOCATION

The area of concern of this overview study of the archaeological resources around St. Louis is defined by the political boundaries which encompass the greater St. Louis metropolitan area. Centering on the City of St. Louis, the area extends across four counties in Missouri (Franklin, St. Charles, St. Louis, and Jefferson) and three counties in Illinois (Madison, St. Clair, and Monroe). The two states are physically separated by the Mississippi River which flows from north to south through the center of the area (see Fig. 1). Measuring a maximum of approximately 95 miles in an east-west direction and 70 miles north-south, the study area contains 4500 square miles. The largest county, Franklin, covers 934 square miles and the smallest, Monroe, covers 382 square miles.

The area is bounded by Latitudes 38° 00′N and 39° 00′N and by Longitudes 89° 35′W and 91° 23′W. In the Universal Transverse Mercator grid system which was utilized for plotting the data in the project, the study area lies at the junction of Zone 15 and Zone 16 (Longitude 90° 00′W) and is generally bounded by 640,000m E (Zone 15) and 280,000m E (Zone 16) and by 4,210,000m N and 4,320,000m N (Fig. 1).

CLIMATE

The generally humid, temperate climate of the greater St. Louis area is typically continental having highly variable daily and seasonal weather conditions. The area lies along the southern margin of a wedge of dry continental air and on the northern margin of humid, tropical air (Wright 1968: Fig. 2). The climate of the dry wedge is distinctive, displaying less winter precipitation than other areas of the eastern United States, and having variable patterns of summer rainfall with intermittent and sometimes extended periods of summer drought (Borchert 1950). Records for the City of St. Louis (Kazeck 1973) indicate that although the average annual temperature is a temperate 56°, seasonal variations produce cool winters and hot summers. The average annual precipitation over the last 80 years is 35 inches with the highest monthly averages occurring in April, May, and June. Violent storms in June, July, and August, however, frequently produce locally heavy rains and flooding conditions. Periods of drought during the summer months also occur. In historical perspective, the climate is presently cooler and moister than during the warm, dry xerothermic period which peaked about 7000 years ago (Wright 1968:83).

GEOLOGY

The St. Louis region can be separated into two major geological features, the Ozark Dome and the Till Plains (for more detailed geological descriptions of the area see Fenneman 1909, Branson 1944, Bretz 1965, Thornbury 1965, E-W Gateway 1973c: Plate 9; Yarbrough 1973). The northeast part of the Ozark Dome lies in Franklin and Jefferson counties in the southwestern section of the study area. To the north of the Ozark Dome in Missouri and to the east in Illinois lie broad expanses of hilly till plains formed by the glaciers of the mid-Pleistocene period. The boundary between the Ozark Dome and the surrounding plains is often difficult to establish and "is not between highlands and lowlands, but between rough topography and topography with very gentle slopes" (Branson 1944: 351).

The surface bedrock of the greater St. Louis area dates to the Paleozoic Era and is dominated by carbonate rocks. The age of bedrock exposures generally ranges from early in the west to late in the east due to the pronounced uplift of the western sectors associated with the Ozark Dome. The Ozark Highland area is rugged and marked by a succession of cuestas or escarpments (Bretz 1965: Pl. 1). The Avon Escarpment barely impinges on the southwestern corner of Jefferson County and is capped by Cambrian dolomite (Thornbury 1965:

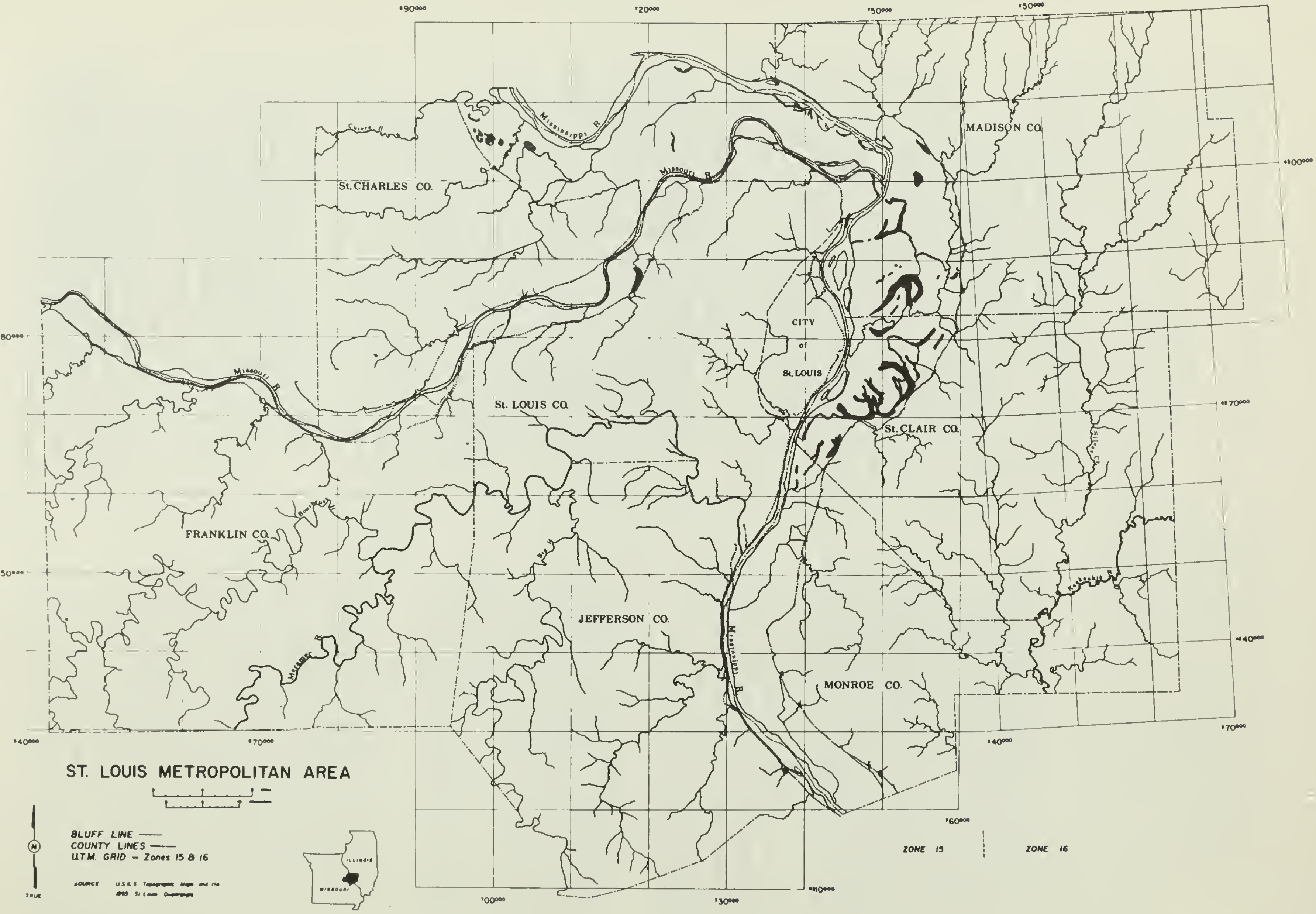

FIGURE 1. Political divisions of the metropolitan St. Louis area.

264). Dolomites also dominate the bedrock in Franklin and Jefferson counties. The Crystal Escarpment passes through central Jefferson County in a southeast to northwest direction and crosses the northeast corner of Franklin County. This escarpment is capped by Ordivician sandstones and limestones. The most eastern escarpment is the Burlington which passes through Jefferson, St. Louis, and St. Charles counties. The Burlington Escarpment is supported by chert-laden Mississippian limestones (Thornbury 1965:264). To the east of the Burlington Escarpment underlying the City of St. Louis and extending into Illinois is the Late Mississippian St. Louis limestone. Pennsylvanian period limestone, shale, coal, and clays cap the Mississippian formations in St. Louis and throughout the Illinois portion of the region. The erodable Pennsylvanian deposits in Illinois have created an unusually wide floodplain along the Mississippi River.

Pleistocene period deposits in the region include glacial and non-glacial features which have produced gently rolling and rugged areas. In Missouri north of the Missouri River are highly dissected till plains from the Kansan and possibly earlier Nebraskan glacial stages. In Illinois, the uplands are covered by dissected tills from the later Illinoian stage. Although ice did not reach the study region during the Wisconsinan stage, the outwash from the glacial melt along the major sluiceways of the Illinois, Missouri and Mississippi rivers produced several important features. The increased outwash load caused aggradation of the riverways and produced thick fill in the valleys consisting of sands, gravels, silts and clays. The lighter particles deposited along these outwash channels were subsequently redeposited along the river bluffs by wind action. These loess deposits reach a thickness of over 30 feet along both the Missouri and Illinois margins of the Mississippi River. The deposits decrease in depth and ruggedness as distance from the river increases.

SOILS

The soils of the St. Louis area are highly variable due to variation in parent materials, vegetation, slope, and drainage patterns (e.g., Vanatta and Lewis 1911, Krusekopf and Pratapas 1919, Smith and Smith 1938, Shrader and Krusekopf 1956, McKenzie and Fehrenbacher 1961, USDA-SCS 1970, USDA-SCS n.d.). In general the soils are thin and stony in the upland portions of the Missouri Ozarks region and along streams which have cut into bedrock. Today these areas are primarily forested. Soils developed on the loess capped glacial uplands in Missouri and especially in Illinois are highly productive agriculturally, providing that drainage is adequate and the slopes are not too steep. Where the loess mantle is thin and streams have cut through the fine deposits, the till or bedrock substrate produces clayey or stony soils. Steep or poorly drained soils in stream valleys are currently forested.

The recent alluvial soils in the Missouri and Mississippi river bottomlands consist primarily of sand and silts with a few areas dominated by clay deposits. Because of the complex history of cutting and aggrading in both river valleys, soil types display variation across short distances especially in ridge and swale regions. On generalized soils maps these areas are frequently illustrated as simply bottomland soils. The well drained bottomland soils, not yet buried beneath the urban sprawl, are agriculturally productive.

VEGETATION

The greater St. Louis area lies along the southern margin of the Prairie Peninsula which extends across northern Missouri, most of Illinois, and into Indiana. The Prairie Peninsula is an eastward extension of the central North American grassland and has probably been present in the St. Louis area since 8000 years ago. It appears to have reached a maximum extent about 7000 years ago and attained its present size and location around 4000 years ago (Wright 1968). The prairie is basically an upland tall grass prairie, but patches of wet, bottomland prairie occur along the Mississippi River in the St. Louis area.

Modern land-use practices have substantially altered the native vegetation distributions in the St. Louis region. Lumbering, agriculture, mining, and urbanization have destroyed large expanses of native forests and prairies. Today remnants of former woodlands are found growing in poorly drained areas along streams, on steep slopes along bluff edges, and in the rugged portions of the Ozark uplands. There are even fewer remnants of the former prairies.

By using the plats from the original United States Land Survey conducted during the first half of the 1800s, it was possible to construct a map of the general distribution of premodern vegetation for the study area (Fig. 2). Supplementary sources included the notes of the Land Survey which were utilized to clarify the location of the prairie boundaries in the City of St. Louis. In addition, the 1796 map of G. V. H. Collot (1942) was used in delimiting the prairie areas along the southern portion of the Mississippi River Valley since agricultural practices had evidently already obscured these areas by the time of the Land Surveys. Areas of prairie openings and woodland were plotted in Figure 2. No attempt was made to construct more detailed vegetational maps distinguishing between the different prairie or woodland plant communities.

Major prairie areas occur primarily in the eastern portion of the Illinois uplands and also in the Missouri uplands in St. Charles County. Bottomland prairie is found along the Mississippi River and is most extensive in the northern and central portions of the Valley. No prairie areas occur along the Missouri River Bottoms.

Woodland vegetation is widespread in the Ozark areas, the river valleys, and the stream beds in prairie areas. The deciduous forest is dominated by oak and hickory (Shelford 1963: 19) but a variety of plant communities occur in association with varying conditions of moisture, soils, and slope (Steyermark 1959). The rugged Ozark areas display a mosaic of different woodland plant communities (Steyermark 1959), while the large river valleys produce linear zones of woodland vegetation (Gregg 1972).

PHYSICAL REGIONS

The St. Louis area lies at the intersection of several physiographic zones as defined by Fenneman (1938: Pl. VI). The southwestern portion of the area is composed of the northeast section of the Ozark Plateaus. To the north of the Ozark area lie the Dissected Till Plains of Missouri, Kansas, and Nebraska. To the east lie the less highly dissected Till Plains of Illinois and Indiana. In addition, St. Louis is situated only 100 miles north of the Mississippi Embayment region of the Gulf Coastal Plain. The broad valleys of the Mississippi and Missouri Rivers further divide the area and generally form a border at the east and north edges of the Ozark uplands.

For the purposes of this study, the St. Louis area was separated into eight discrete physical regions defined by geomorphic and topographic features (Fig. 3). The eight regions are: the Illinois Uplands, the Missouri Uplands, the Ozark Rim, the Ozark Uplands, the Mississippi River Bottom-North, the American Bottoms or the Mississippi River Bottom-Central, the Mississippi River Bottom-South, and the Missouri River Bottom. The general characteristics, slopes, soils, modern vegetation, and water resources will be described for each region. Data on slope, drainage, and vegetation were obtained primarily from maps prepared by the East-West Gateway Coordinating Council (1973b: Figs. 11, 12, and 13).

Illinois Uplands

This region is a part of the till plains section of Illinois and Indiana. It is characterized by a gently rolling topography created by the erosion of the loess-capped, glacial tills. The eastern two-thirds of the region has gentle slopes of less than 6% (Fig. 4) except in occasional areas of ridged drift remnants. The drainage in the eastern portion is southward to the Kaskaskia River which flows to the southwest where it joins the Mississippi River just south of the study area. The meandering courses of the larger streams such as Silver Creek and Richland Creek have gradual gradients, and flood frequently. Many of the tributary streams are also subject to flooding (SIMAPC 1973).

The western portion of the Illinois Uplands is marked by more rugged topography and exhibits areas of moderate to steep slopes from 6% to greater than 16% (Fig. 5). The local relief is produced by the thick, eroded loess deposits along the eastern bluff of the Mississippi River Valley in Madison and St. Clair counties. Streams in this section have cut steep valleys through the loess deposits as they drain to the west into the Mississippi River Bottom. Some of the larger streams include Wood River, Cahokia Creek, Canteen Creek, Prairie du Pont Creek, and Fountain Creek. All these streams are subject to flooding along their upland valleys. To the south in Monroe County many sinkholes in the Mississippi limestone bedrock have produced a rugged karst topography. There are few permanent streams in the karst area.

The soils of the Illinois Uplands are some of the most agriculturally productive in the St. Louis area. They derive from the extensive loess deposits and the quality of the soil generally decreases as one

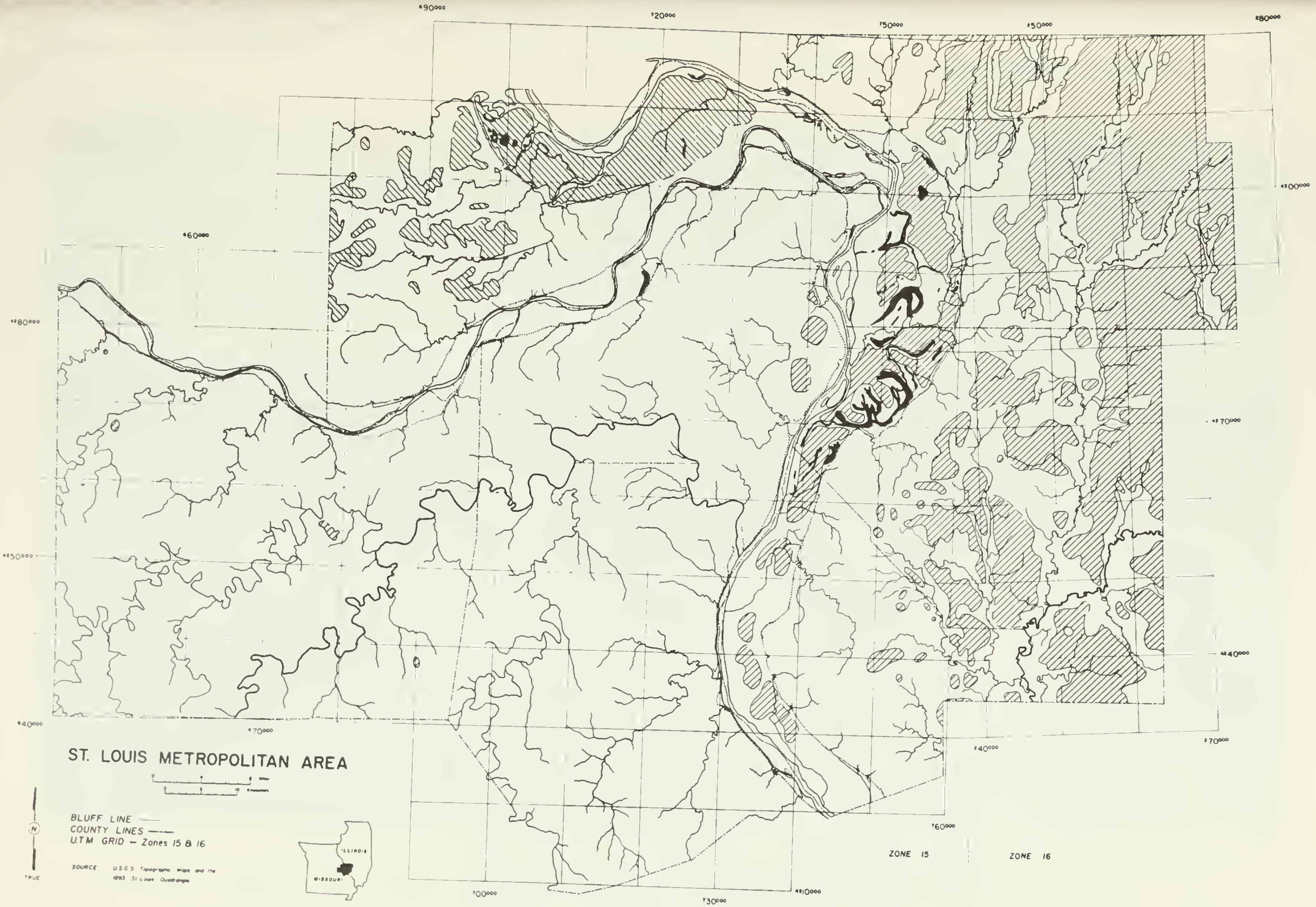
ST. LOUIS METROPOLITAN AREA
BLUFF LINE
COUNTY LINES
U.T.M GRID – Zones 15 & 16
SOURCE U.S.G.S. Topographic Maps and the 1893 St. Louis Quadrangle
N
TRUE
ILLINOIS
MISSOURI
ZONE 15
ZONE 16

FIGURE 2. Pre-modern vegetation near St. Louis. The shaded areas denote prairie vegetation and the blank areas indicate woodlands or brush.

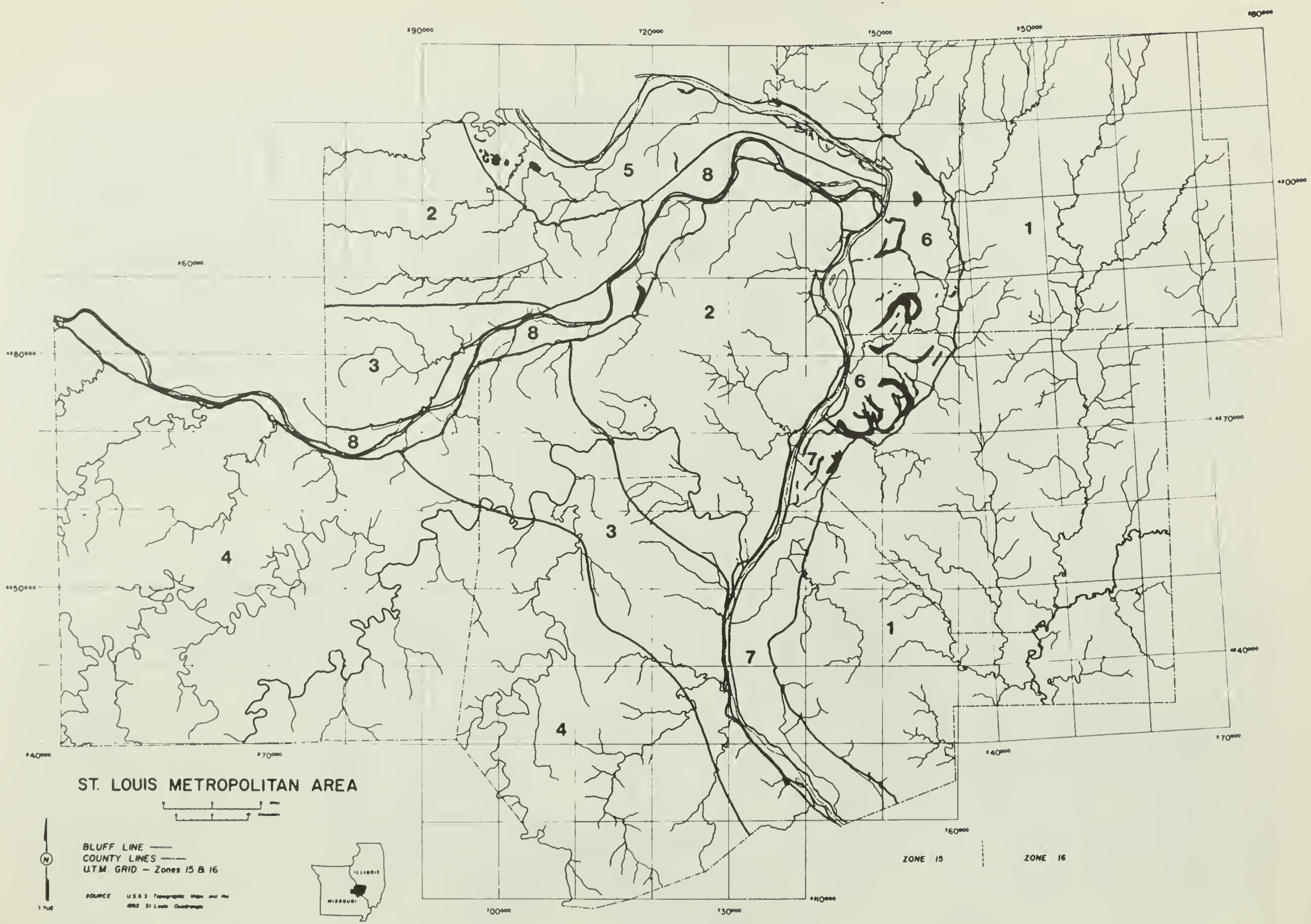

FIGURE 3. Physical regions of the St. Louis area: 1) Illinois Uplands, 2) Missouri Uplands, 3) Ozark Rim, 4) Ozark Uplands, 5) Mississippi River Bottom-North, 6) American Bottoms, 7) Mississippi River Bottom-South, 8) Missouri River Bottom.

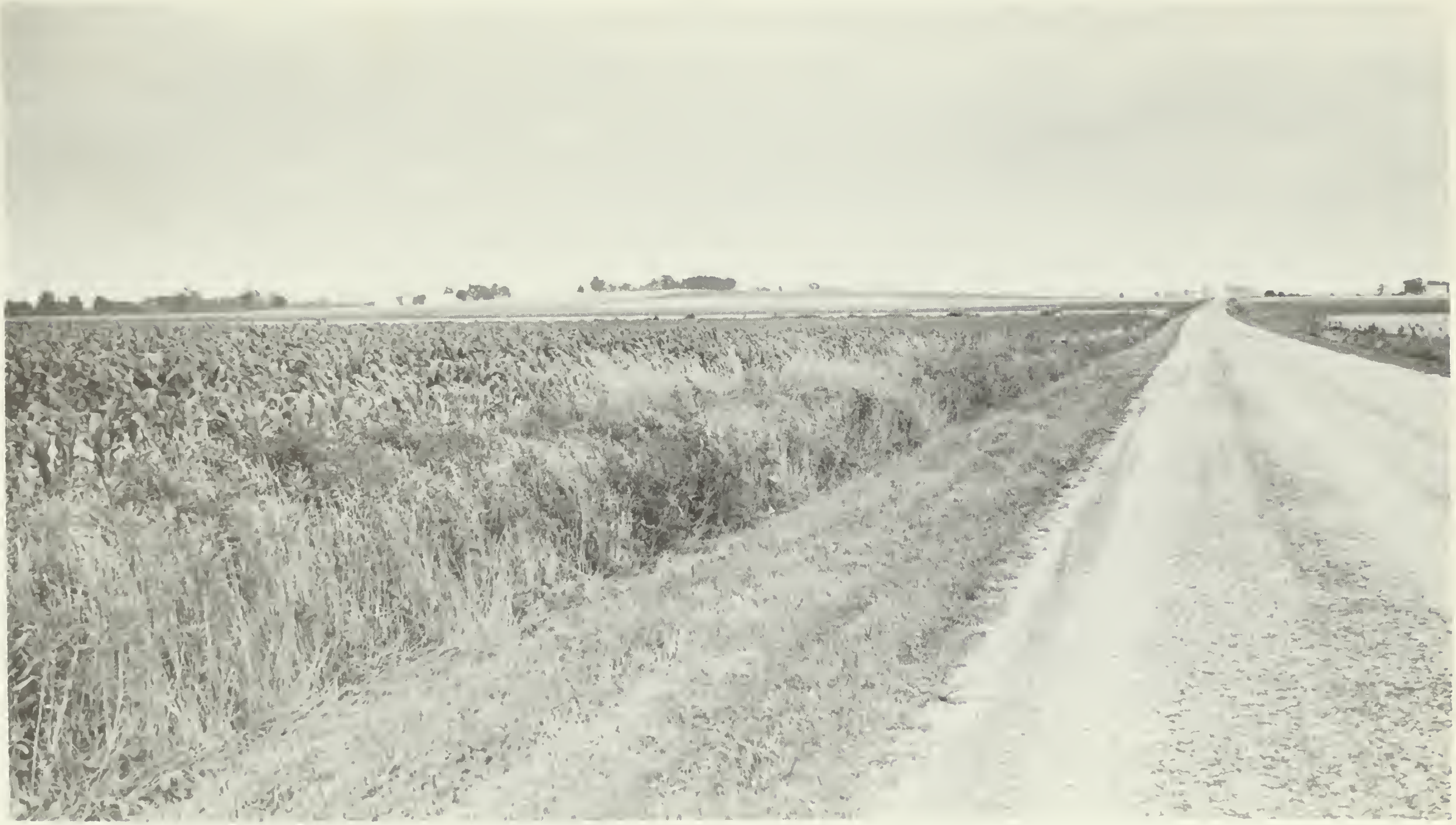

FIGURE 4. View of the eastern portion of the Illinois Uplands showing the flat to gently sloping terrain and extensive agricultural land.

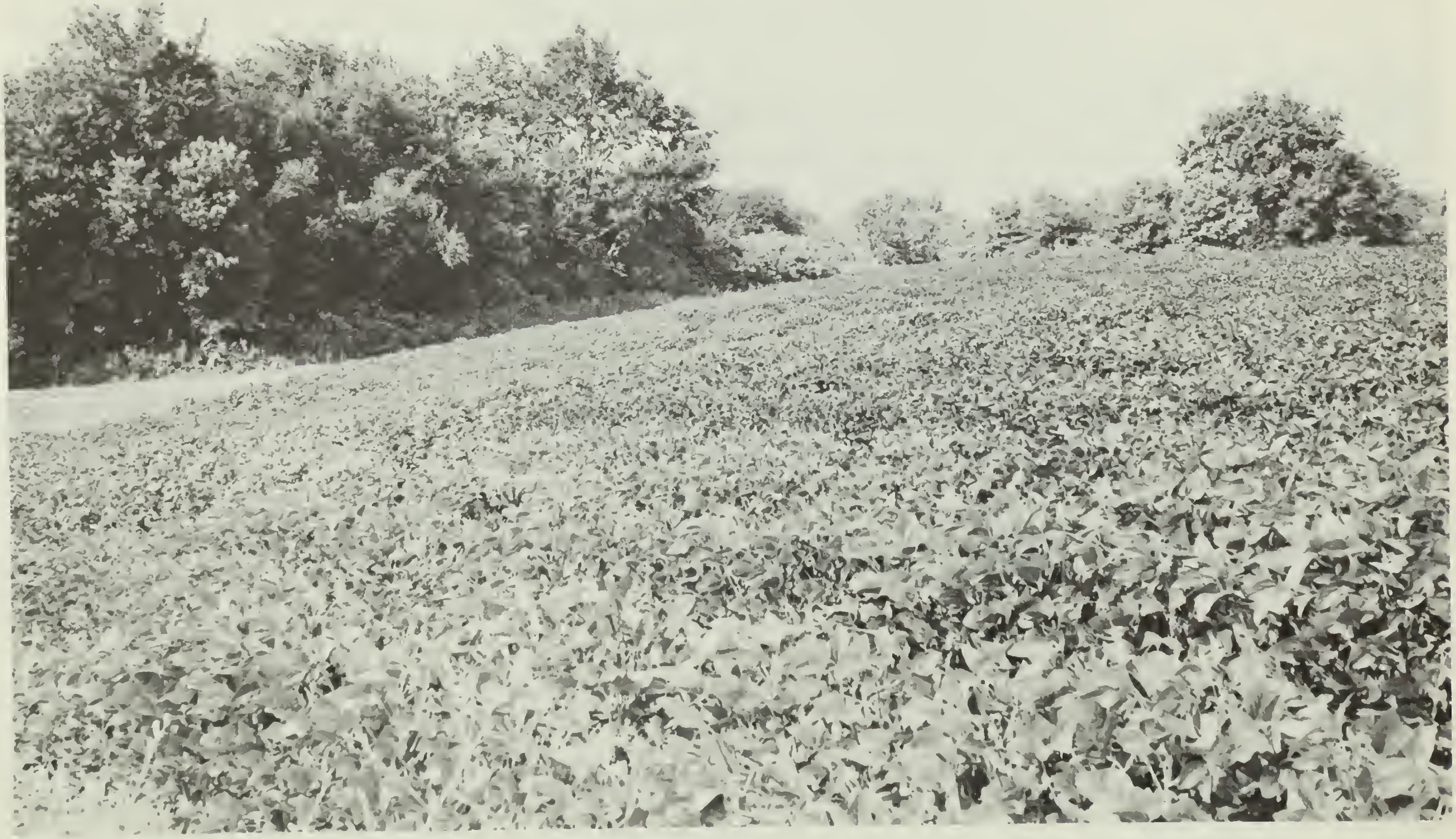

FIGURE 5. The western portion of the Illinois Uplands near the bluffs of the American Bottoms showing the hilly terrain.

moves away from the Mississippi River Valley. The soils are generally rich in minerals and well drained. Poorly drained areas commonly occur along stream valleys and in the level uplands toward the eastern margin of the region (Smith and Smith 1938, USDA-SCS 1970).

Woodlands cover the wet stream valleys and steeply sloping areas of ridged drift and loess hills. The remainder of the uplands is primarily agricultural land.

Missouri Uplands

This region lies along the southeastern margin of the Dissected Till Plains produced in Kansan times. The rolling upland is characterized by gentle to moderate slopes of up to 15% except along the steep limestone and loess bluff borders of the Missouri and Mississippi river bottoms. Much of the Missouri Uplands are in St. Charles County north of the Missouri River. The City of St. Louis and its surburbs are located on a section of the Missouri Uplands south of the river. The area is composed of eroded and dissected loess capped glacial tills with occasional zones of karst topography south of the Missouri River.

The soils in the Missouri Uplands are derived from a number of different sources. Near the Mississippi and Missouri river bluffs, the loess formations produce deep, agriculturally productive soils. As distance from the bluffs increases, however, the loess mantle becomes thinner and the soils become stony in areas where the bedrock substrate is limestone. Where the parent material is glacial till the soils are clayey (Shrader and Krusekopf 1956).

Woodland vegetation in the nonurban areas occurs presently in steeply sloping areas or along poorly drained bottomlands. Areas with gentle to moderate slopes generally have been cleared for crops or pasture.

Most of the portion north of the Missouri River drains eastward into the Mississippi River via the Cuivre River, Peruque Creek, and Dardenne Creek. South of the Missouri River in St. Louis County, drainage is by way of relatively short streams which empty directly into either the Missouri or Mississippi rivers.

Ozark Rim

This physical region is delimited by the Crystal and Burlington escarpments and forms an arc through Jefferson, western St. Louis, and southern St. Charles counties. The region generally conforms to Marbut's Zell Platform (1896: Pl. 2). The Ozark Rim region displays the most rugged topography in the St. Louis area (Fig. 6). Although there are gentle slopes of 5% or less in the valleys of the larger streams and rivers, the majority of the region is characterized by steep slopes of greater than 16%. The region is the most highly folded and faulted portion of the study area and is composed of limestone, dolomite, sandstone, and shale outcroppings which date from Ordivician to early Mississippian times (Bretz 1965:92). Soils are shallow and stony. The vegetation is predominantly forest except along the few broad stream valleys where farming practices have destroyed the forests.

Several waterways crosscut the Ozark Rim region and their courses apparently predate much of the uplift activity which produced the region. The largest, the Missouri River, courses to the northeast where it cuts across the northern portion of the Rim. North of the Missouri River, at the eastern margin of the rim, in St. Charles County, Femme Osage Creek and its tributaries flow into the Missouri River. Immediately south of the Missouri River short tributaries drain the uplands before emptying directly into the Missouri.

The second largest waterway transecting the region is the Meramec River which meanders generally in a northeastward direction, then flows southeast along the eastern border of the Ozark Rim to where it joins the Mississippi River. The largest tributary to the Meramec in this region is the Big River which flows north across the southwestern edge of the Rim. Both rivers flow along entrenched meanders in relatively wide valleys. They are subject to flooding.

Drainage systems south of the Meramec watershed flow eastward into the Mississippi River. The largest streams are Plattin and Joachim creeks. The narrow valleys of these streams are often flooded, especially along their lower reaches.

Ozark Upland

This region, part of the Salem Plateau (Bretz 1965: Pl. 1), includes practically all of Franklin County and southwestern Jefferson County. The

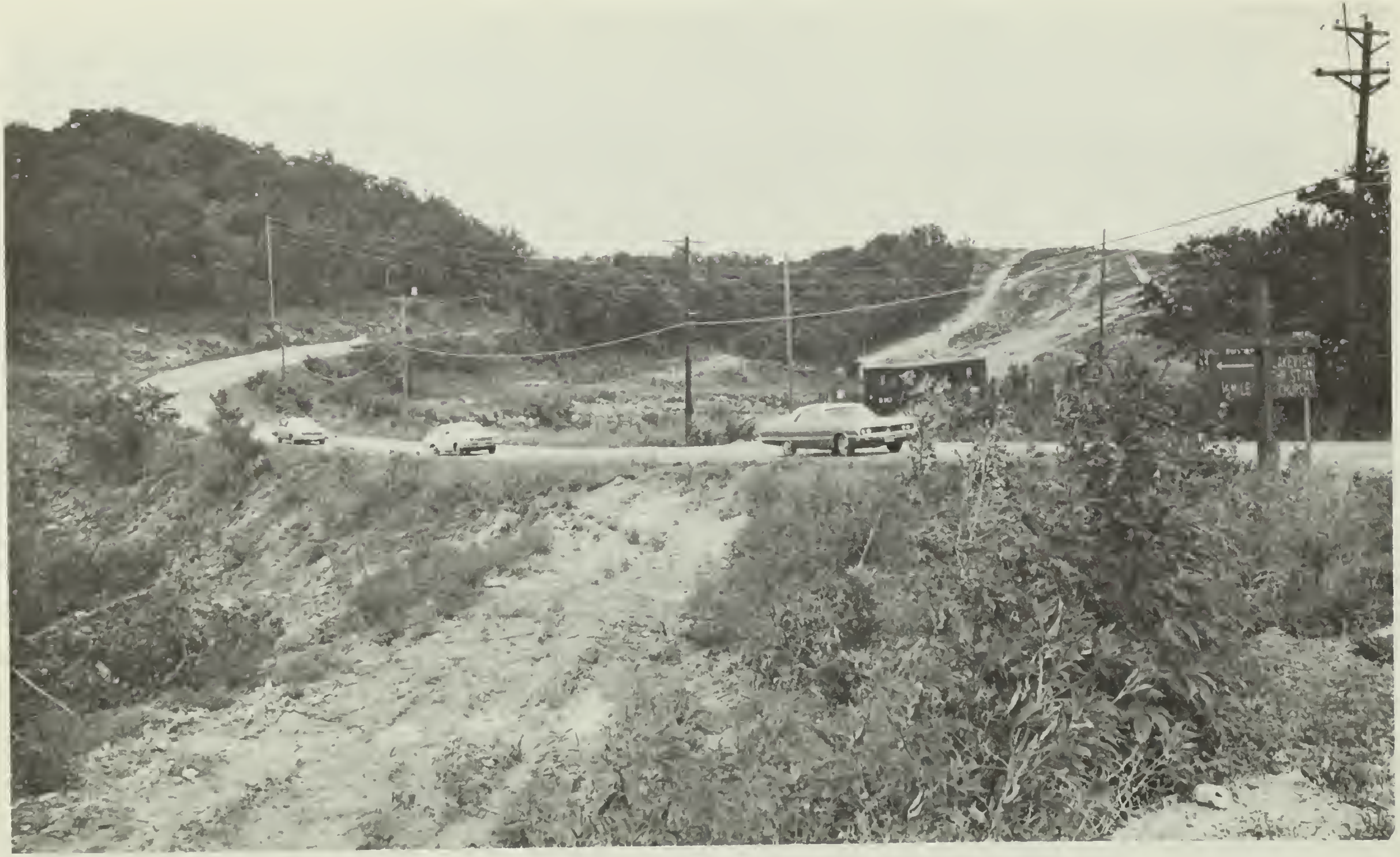

FIGURE 6. View of the Ozark Rim showing the rugged topography and partly forested areas. The highway is in the process of being expanded.

upland also falls within the provenience of the northern Ozark Border as defined by Collier (1953). The region is characterized by hilly uplands with occasional plateau-like summits which are remnants of former peneplains (Bretz 1965). The vast majority of the area is composed of moderate slopes from 6% to 15% (Fig. 7), but a few locations have steep slopes of greater than 16%. The only areas with gentle slopes are found along the valley floors and on the upland peneplain remnants.

The Ozark Upland region has a complex geological history consisting of several episodes of uplift, each followed by gradual degradation toward a peneplian. The more recent uplifts have been less pronounced than the earlier episodes and have had the effect of rejuvenating the area's streams and producing entrenched meanders bordered by relatively broad bottoms in the stream valleys (Bretz 1965). The underlying rocks are Ordivician limestones and dolomites and the upland soils tend to be shallow and stony except on the loess capped areas bordering the Missouri River (Vanatta and Lewis 1911).

The modern vegetational cover consists of forested areas on moderate to steep slopes and prairies or farmland on the gently sloping uplands. The river and stream valleys, unlike those in the Illinois Uplands, are not forested since they have been cleared for agricultural purposes.

Drainage is to the north and east away from the center of the Ozark Dome with most of the water flowing into the Meramec River. The Meramec River is the third largest in the St. Louis area. Its meanders are entrenched into a floodplain that varies between 1/4 mile and 1 mile wide, bordered by steep limestone bluffs. The valley is subject to flooding along its entire length.

The Meramec drainage system has two major tributaries, the Bourbeuse River on the west and the Big River on the east. Both streams exhibit entrenched meanders and are fed by small tributaries with steep grades. The Bourbeuse River floods along its lower reaches and the Big River floods along its entire length.

North of the Meramec watershed streams such as Big Berger, Boueuf, and St. John's creeks and smaller tributaries empty directly into the Missouri River. The lower reaches of the larger streams are subject to flooding.

Mississippi River Bottom-North

This region is located in the northeast portion of St. Charles County. The Bottom averages 5 miles in width and lies entirely on the south and west side of the Mississippi River. The Bottom is bounded by the Missouri Upland loess bluffs along its western side and by the Missouri River Bottom on its southern edge. Slopes in the region are less than 5%.

The soils are recent alluvium and range from sandy loams to heavy clays. The eastern part of the region is composed primarily of sand and silt loams and the soils are generally well drained although they are subject to flooding by the large rivers. The region's central and western areas are composed principally of poorly drained silts and clays (Shrader and Krusekopf 1956:10-12). Forests presently border the rivers, streams, and lakes and the remainder of the area was cleared long ago for agriculture.

Water resources consist of lakes, in the western and central section, and streams. The larger lakes include Dardenne Lake and Marais Temps Clair. Most of the streams originate in the Missouri Uplands region and although their courses meander across the bottomland, they generally flow directly into the Mississippi River without paralleling the river for any distance. The larger streams are the Cuivre River, Peruque Creek, and Dardenne Creek. The entire Bottom is subject to flooding.

American Bottoms (Mississippi River Bottom-Central)

This region lies along the east side of the Mississippi River in Illinois and extends from just above the confluence of the Missouri and Mississippi rivers at Alton, Illinois to the narrowing of the bottom at Dupo, Illinois. The region is a broad expanse of river bottom created by the river eroding the soft Pennsylvanian formations of shale, coal, and sandstone (Fig. 8). The narrowing of the bottomland at Alton and at Dupo is produced by the presence there of Mississippian limestones which are more resistant to erosion. The maximum dimensions of the American Bottoms are 11 miles east-west and 30 miles north-south, encompassing an area of 175 square miles.

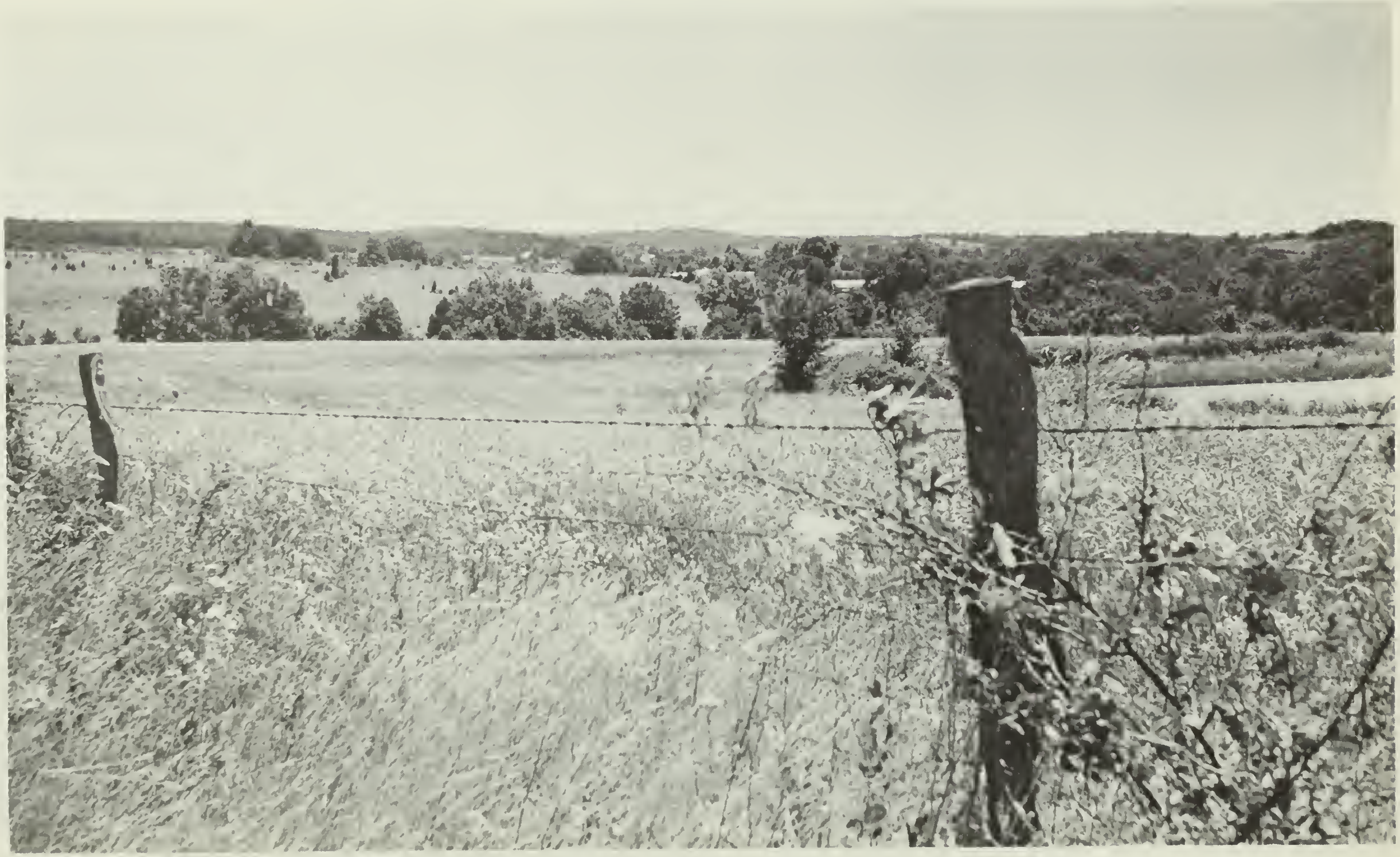

FIGURE 7. The hills, woods, and farmlands of the Ozark Uplands.

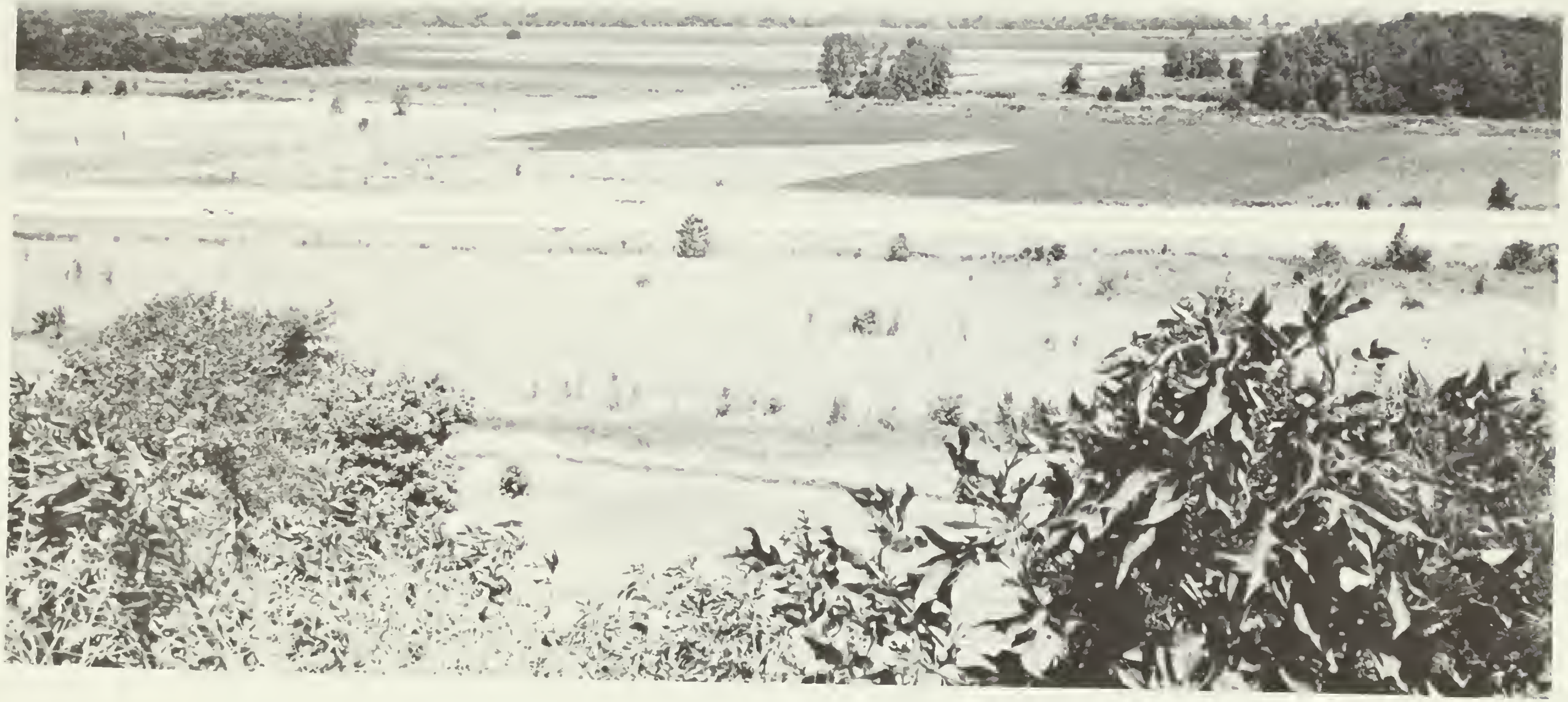

FIGURE 8. View of the flat American Bottoms from the top of Monks Mound at the Cahokia Site looking north across an interstate highway.

Seven distinct subregions have been defined within the American Bottoms (Yarbrough and Chiste 1972) which reflect its complex geological history. The subregions include the terrace area, the tributary meander belt, the aggraded cut and fill section, the alluvial fan area, the ridge and swale section, the lakes region, and the East St. Louis rise.

Several of the subregions are located in the northern portion of the Bottoms. The terrace region, located at the northeast edge, is an area of high, sandy Pleistocene terraces and is partially covered by the community of Wood River. This subregion is separated from the bluffs by the poorly drained tributary meander belt which begins at the north end of the Bottoms and parallels the bluffs to the central portion of the Bottoms where it merges with the lakes district. The aggraded cut and fill region consists of heavy clays and silts deposited by the flooding from streams and old river channels in the northern portion of the Bottoms and extends into the central section.

The alluvial fan region is found along the base of the bluffs in the central portion of the Bottoms and is composed of well drained, redeposited loess from the uplands. The ridge and swale region is located along the Mississippi River and covers the west central portion of the Bottoms between the lakes region and the river. The area is composed of narrow, curving, sandy ridges separated by low-lying areas of swamps and sloughs.

The lakes region covers most of the southern half of the Bottoms and was an area of large oxbow lakes separated by the East St. Louis rise. Most of the lakes have been drained in order to promote urban and industrial expansion. The only large one remaining is Horseshoe Lake, located in the center of the Bottoms. The East St. Louis rise, found at the southern end of the Bottoms, is a large, dissected alluvial fan area extending from the bluffs on the east to the Mississippi River on the west. The East St. Louis rise is presently the most highly urbanized area in the Bottoms.

The soils of the American Bottoms derive from recent alluvium and slope wash. The soils consist of sands and gravels on the Pleistocene terraces, sandy loams on the ridges, fine sandy loams or silt loams along the alluvial fans, and silts and clays in the swales and aggraded areas (Yarbrough and Chiste 1972, Smith and Smith 1938). The well-drained soils of the terraces, alluvial fans, and ridge and swale are still highly productive agriculturally. The poorly drained soils, swamp areas, and lake and stream borders support woodland and other wet bottomland vegetation.

Drainage systems consist of streams, lakes, sloughs, and swamps, as well as the Mississippi River. All the streams originate in the Illinois Uplands and include from north to south the Wood River, Cahokia Creek, Canteen Creek, Schoenberger Creek, and Prairie du Pont Creek. Upon descending into the American Bottoms the gradient of the streams is drastically reduced and the streams become meandering, subject to flooding, and frequently change their channels, especially in times of high water. Before canalization the streams entering the Bottoms near its north end paralleled the bluffs until emptying into the lakes in the southern portion of the Bottoms. The lake outlet streams then paralleled the course of the Mississippi River and only joined with it at the very southern end of the Bottoms. The lakes are shallow remnants of oxbows and sloughs. Before the Bottoms were drained the major lakes were Long Lake and Horseshoe Lake which still exist, Indian Lake, Spring Lake, Grand Marais Lake, and Cahokia Lake. A few small lakes in the northern portion of the Bottoms are produced by poor drainage factors in the meandering tributary region. Swamps border lake areas and stream courses and can also be found in the low-lying parts of the ridge and swale section.

The entire American Bottoms region has been subject to flooding both from the Mississippi River, primarily south of its junction with the Missouri River, and from the tributary streams which enter the Bottoms from the east. The many lakes and swamps and the generally high water table also contribute to flooding and ponding. The construction of levees along the Mississippi River in conjunction with canalization and landfill projects has reduced the threat of flooding across much of the region but problems of internal ponding still exist in low-lying areas.

Mississippi River Bottom-South

This region lies along the Illinois side of the Mississippi River in Monroe County primarily. The bottomland averages 3 miles in width and is bordered on the east by high limestone bluffs. The region extends from Dupo, Illinois on the north where the bluffs begin to constrict the bottoms to the Randolph County line on the south. The area is characterized by ridge and swale topography with slopes of less than 5%.

No detailed soils data are available for the region but the area appears to have typical alluvial soils with sandy loam ridges and natural levees and silty clay in low-lying areas. The region is now predominantly agricultural land although wooded areas are found along the Mississippi River and in a few wet, low-lying zones.

Water resources are streams, a few small lakes in old meander scars, and swamps. Streams usually originate in the uplands. Once they enter the bottom, streams tend to parallel the course of the Mississippi River for miles before joining it. Large streams include Carr Creek, Fountain Creek, Maeystown Creek, and Fults Creek. Lakes such as Fish Lake and Moredock Lake are narrow and shallow; many others have been drained. Swamps occur in areas of former lakes, along streams, and in low sloughs and swales. Prior to the construction of levees along the Mississippi River, the entire bottom was subject to periodic flooding. Currently, flooding occurs along streams and low-lying areas especially in the southern third of the region.

Missouri River Bottom

This region parallels the northern border of the Ozark highlands between Franklin and St. Louis counties on the south and St. Charles County on the north. The bottom lies on either side of the Missouri River and is generally characterized by ridge and swale features with slopes of less than 5%. Many large islands lie along the course of the river. The region is bounded by the high limestone and loess bluffs of the surrounding uplands. The bottomland ranges from 2 to 3 miles in width.

The recent alluvial soils along the Missouri River Bottom consist of sand, fine sandy loam, and clay loam but are predominately sandy loams rather than clays (Shrader and Krusekopf 1956:4). Most of the region is currently under cultivation except for the very low-lying areas along the streams and the Missouri River which are wooded.

Water resources in addition to the Missouri River are streams which originate in the uplands. Some of the larger streams which cross the bottom include Berger Creek, Femme Osage Creek, Bonhomme Creek, Caulk's Creek, and Creve Coeur Creek. The streams either parallel the bluffs for a short distance before joining with the Missouri River or flow directly to the river after leaving the uplands. Creve Coeur Lake in St. Louis County is the one sizeable lake in the Missouri River Bottom. The bottom along its entire length is subject to flooding from the Missouri River.

REGIONAL ARCHAEOLOGY

The prehistoric record of man in the New World spans a period of at least 10,000 years and covers not only a wide range of territory but also a variety of socio-cultural developments. This chapter examines the present state of archaeological knowledge in the Midwest and focuses on data from the Illinois area. In the interest of brevity and hopefully some clarity, the presentation follows a format organized around temporal periods. The labels given to each period, such as *Archaic, Woodland,* and *Mississippian,* however, also denote cultural traditions. As a result there is frequently temporal and cultural overlap between periods. The description of each period will present its temporal placement, general subsistence strategy, settlement morphology, and physical location. Since the purpose of this chapter is to provide a framework for assessing the significance of the archaeological resources of the St. Louis area, recommendations as to the significance and priority of archaeological resources present in the St. Louis area will also be made.

PALEO-INDIAN

Although man may have entered the New World between 20,000 and 40,000 years ago, the first solid evidence for his presence in the Midwest comes from the Paleo-Indian period which dates 10,000-8,000 B.C. By this time man had radiated throughout both continents of the Western Hemisphere and had developed distinctive tool kits for exploiting the environment (Willey 1966:51). Archaeological data suggest that the primary emphasis of subsistence activities centered around hunting large, late Pleistocene mammals such as extinct forms of bison, mammoth, and mastodon. Because of the emphasis on these mammals, the exploitative pattern is frequently referred to as the Big Game Hunting Tradition. It is probable that small game animals and plant resources also played an important, if not dominant, part in the subsistence activities during this period (Griffin 1967:167), but there is currently little archaeological evidence to substantiate this proposition. Social groups probably consisted of small bands which wandered over large areas in pursuit of game and other scattered resources.

Paleo-Indian sites are known from the American Southwest to the Atlantic Seaboard and from the Gulf of Mexico to the upper Great Lakes. In the West known sites are primarily locations where large mammals were killed and butchered. Evidence for Paleo-Indian occupations in the East more frequently come from campsites and workshop stations. Paleo-Indian sites in the Midwest are known primarily from surface discoveries rather than from excavated contexts and are found in upland situations, near former lake shores, or on high terraces of river and stream valleys (Griffin 1968:125-26). The virtual absence of Paleo-Indian sites on river bottoms may be a result of major depositional and erosional changes since the end of the Pleistocene (Griffin 1967:167). The occurrence of Paleo-Indian sites in isolated upland contexts, however, may be related to the availability and distribution of important subsistence resources in these areas (Brown and Cleland 1968:121).

The present state of knowledge of the Paleo-Indian period in the Midwest, as well as in the rest of the country, is extremely limited. The paucity of known Paleo-Indian sites is probably related both to the small population size and nomadic lifeways of Paleo-Indian groups and to factors affecting site preservation such as erosion and deposition of sediments. Because so little is known about Paleo-Indian and because it is the earliest period for which there is evidence of man's occupation of the Midwest area, it is extremely important that any Paleo-Indian sites be examined and preserved if they are found to have some contextual integrity.

ARCHAIC

The transition from Paleo-Indian to Archaic occurred gradually throughout the eastern Woodlands (Griffin 1967:178) and is generally correlated with the retreat of the glaciers as well as the concomitant change in the kinds and distributions of plant and animal resources. Dates assigned to the Archaic period range between approximately 8000 B.C. and 1000 B.C. This long period can be further subdivided into three parts: the *Early Archaic* (8000-5000 B.C.), *Middle Archaic* (5000-2000 B.C.), and *Late Archaic* (2000-1000 B.C.) (Willey 1966:249).

Archaic subsistence activities focused on gathering from localized areas a wide range of wild resources such as large and small mammals, birds, fish, nuts, and seeds. Through time Archaic populations developed from small, scattered groups "scavenging" resources over a wide area to larger groups forming greater regional populations which occupied more limited territories. Groups apparently moved from place to place to collect a variety of localized resources in a seasonal round (Fowler 1959). The Archaic period marks the beginning of the development of regional cultural traditions which persist into later times throughout the eastern Woodlands (Caldwell 1958).

During the *Early Archaic* sites tend to be small and scattered, much like those of the Paleo-Indian period. Sites occur primarily in upland situations (Luchterhand 1970:37) but, Early Archaic remains have also been found in rock shelters (Fowler 1959, Logan 1952) and along high river terraces (Dudzik 1974:13). Sites located in upland contexts are frequently concentrated near secondary stream valleys along major rivers (Luchterhand 1970, Dudzik 1974: 12-13). The variety of site locations evidently reflects seasonal shifts of settlements during the Early Archaic (Griffin 1968:130, Fowler 1959, Luchterhand 1970, Munson 1971, Dudzik 1974). In some areas, however, such as the Lower Mississippi Valley where Early Archaic sites are located in bottomland situations, variation in settlement type may be more a reflection of functional differences rather than seasonal shifts (Morse 1973).

Although the number of known Early Archaic sites is probably more numerous than Paleo-Indian in the Midwest, the sites are known primarily from surface discoveries rather than from excavation. As a result there is much to be learned about variations in site morphology, subsistence activities, and social organization during the period. In addition, the chronological relationships of Early Archaic and Paleo-Indian remains are not well understood.

In order to investigate these problems it will be necessary to search for and examine both deeply stratified occupations and well preserved sites which have occupations limited to Early Archaic times. Any sites of this nature which are found to occur in the St. Louis area will be extremely important.

During the *Middle Archaic* subsistence emphasis shifts toward the more intensive utilization of localized resources with a stress on exploiting forest and riverine contexts. Data from the lower Illinois River Valley suggest that a broad spectrum of fauna was being taken along with a limited number of highly productive floral resources such as hickory nuts (Houart 1971, Asch, Ford, and Asch 1972). The appearance of the grinding stone in the tool inventory indicates that nuts and seeds had become an important part of the subsistence base. The beginning of the manufacture of ground stone tools such as axes suggests to some investigators that woodworking was also an important activity (Griffin 1968:133). Base camps with permanent habitation structures (Houart 1971) appear as part of the settlement system and are apparently occupied for most, if not all, of a year. The earliest burials in Illinois also occur during this period.

Middle Archaic occupations are known primarily from rockshelters and open, stratified sites. There are few tool types which can be exclusively associated with the Middle Archaic and so it is only in stratified and datable contexts that Middle Archaic occupations can be distinguished. In areas where information on the Archaic period comes primarily from surface collections, such as the Upper Mississippi Valley (Dudzik 1974) and the greater St. Louis area, no Middle Archaic sites have been identified.

By around 2000 B.C. and the beginning of the *Late Archaic* there was a substantial population increase in the Midwest. Clear regional traditions appear and there is evidence for the interregional exchange of raw materials (Griffin 1967:178). A variety of different settlement types can be distinguished in some areas (Winters 1969) and groups evidently followed a seasonal round, shifting their settlements from place to place within a limited area as different seasonal resources became available (Fowler 1959).

Late Archaic settlements are known to occur on the floodplain, low terraces, and ridges of river and stream valleys as well as in the uplands. Data from the Wabash River in eastern Illinois indicate that there are a number of different settlement types associated with various locations. Permanent houses and storage pits are associated with winter settlements, and less permanent structures are found at summer base camps, small transient camps, and special activity areas (Winters 1969:137).

A number of new cultural features appear during the Late Archaic period. Burials frequently have grave goods associated with them and sometimes are covered by low mounds (Titterington 1950). A variety of ground stone tools and ornaments are produced and new raw materials such as copper from Lake Superior and marine shell from the Gulf Coast are utilized. The beginnings of plant domestication in the Midwest may also have been in the Late Archaic period (Fowler 1971).

Evidences of Archaic occupation are widespread throughout the Midwest. The long period of time subsumed within the Archaic period, the increasing size of the population of the region, and the multiplicity of settlement forms and functions combine to produce a large number of sites. But the sites do not necessarily duplicate one another. As has been noted, regional traditions developed during the Archaic as increasing population pressures restricted groups to smaller territories and, possibly, as the plant and animal resources themselves became more restricted in their distributions.

It is likely that several different Archaic traditions may have been present in the St. Louis area. For example, the rugged Ozark area, the broad river valleys, and the rolling Illinois uplands may each yield evidence of groups with differing adaptive strategies through time. Although as yet unidentified unique manifestations of the Archaic period may exist in the St. Louis area, the processes involved in the growth and diversification of populations during the period are probably not unique to the area. It is recommended, however, that settings which have a high potential for yielding undisturbed and stratified sites from any time period, including the Archaic, be thoroughly examined before destructive land-use programs proceed. These settings would include rockshelters or caves and talus slope areas along the base of loess bluffs.

WOODLAND

The Woodland period is generally dated from about 1000 B.C. to between A.D. 1000 and A.D. 1600. The regional traditions which first developed during the Archaic continue through the Woodland period and are modified by new cultural developments. Subsistence activities continue to focus on intensive gathering and hunting, but domesticated plants become an important part of subsistence as well. The Woodland period is divided into three sequential units called *Early Woodland* (1000 B.C. - 200 B.C.), *Middle Woodland* (200 B.C. - A.D. 400) and *Late Woodland* (A.D. 400-1000) (Griffin 1967). The dating of the various Woodland periods is not agreed on by all archaeologists and there are some areas of the Midwest, especially in the Ozark region, where the cultural manifestations which typify particular time periods elsewhere are absent.

The *Early Woodland* period is very poorly known in most parts of the Midwest. It is identified by the first appearance of pottery vessels, but its lithic artifacts are similar to those of the Late Archaic period (Klippel 1972). Manifestations of the Early Woodland period are evidently not found in the Ozark area of Missouri (Geier 1973:65) and Ozark groups probably continued in the Archaic pattern.

In the lower Illinois River Valley Early Woodland sites are found in only two locations, along low sand ridges near former river channels in the broad bottomlands and along the talus slopes near the base of the bluffs (Struever 1968; Farnsworth 1973). The settlements were apparently occupied seasonally but the site locations were reoccupied through time. No permanent structures or storage pits have been found in association with the Early Woodland settlements of the lower Illinois Valley. Early Woodland burials occur primarily in pits in village areas but some are found entombed in burial mounds (Cole and Deuel 1937). Solid evidence for the domestication of plants during this period comes from caves in Kentucky (Yarnell 1964).

Because Early Woodland sites are scarce and so little is known about the chronology, subsistence activities, settlement organization, and relationships between regional varieties of Early Woodland, it is important that any sites in the St. Louis area be investigated or preserved if it appears that they are undisturbed enough to yield significant data.

The *Middle Woodland* period witnesses an increase in population, an intensification in the exploitation of localized resources, the appearance of an interregional network apparently focusing on the distribution of exotic goods and on burial ceremonialism, and the development of marked status differentiation within social groups.

In the past archaeological attention has focused on the burial mounds and earthworks, which are a distinctive part of the Middle Woodland period, since they contained well-made and "artistic" ceramic, lithic, and metallic artifacts. The period became known primarily for its mortuary practices and artifacts, called Hopewell, which were found in widespread areas of the Midwest. Many areas which had Hopewell artifacts, however, were characterized by their own regional Middle Woodland cultural traditions. Recently archaeological attention has shifted to the investigation of the underlying regional traditions and their economic, settlement, and social organizations.

Middle Woodland subsistence activities relied on the intensive gathering and hunting of localized wild resources. A number of domesticated plants, including maize in the Ohio area, also apparently became increasingly important. In the Illinois River Valley Middle Woodland subsistence activities have been characterized as "Mud Flat Horticulture" and "Intensive Harvest Collecting" (Struever 1964, 1968).

The interregional network, referred to by some archaeologists as the "Hopewellian Interaction Sphere" (Caldwell 1964), involved the redistribution of distinctive artifacts and exotic resources over wide areas and was undoubtedly more than just a mortuary phenomenon. It seems likely that less exotic goods such as food, clothing, and building materials were also part of the exchange system. The demand for the exotic goods was maintained by periodically removing existing artifacts from the network by burying them with the dead. The systematic, ritual exchange of exotic artifacts between regions may have served to insure that food and other critical resources could flow easily from one region to another, especially during periods of localized shortages. These exchange mechanisms would foster the survival of a multiplicity of large groups over a large region characterized by areas of localized resources (Diener 1968).

In the area of Missouri and Illinois, local Middle Woodland traditions frequently display evidence of having participated in the Hopewellian Interaction Sphere. Middle Woodland settlement systems include sites with large mounds which contain burials of important persons accompanied by the burials of other individuals of lesser rank. Mortuary artifacts may include diagnostic Hopewell pottery vessels, clay figurines, stone pipes, marine shell, copper, obsidian and a variety of other exotic materials. Hopewellian artifacts also occur in village areas and specialized settlements where they may have been manufactured or used for nonmortuary purposes.

In Illinois, Middle Woodland settlements appear to have focused on river valleys bounded by distinct uplands where a variety of subsistence resources are available within relatively short distances. In the Illinois River Valley settlement systems consist of a number of functionally differentiated sites (Struever 1968). Regional centers displaying concentrated midden areas, mounds, and exotic raw materials occur on the floodplains but may have been only seasonally occupied. Basecamps are located near the bluffs where tributary streams enter the valley. A number of smaller seasonal and special purpose settlements displaying mounds or cemeteries occur along the river bottom. Middle Woodland sites in the uplands bordering the valley consist only of bluff top burial mound groups. The general pattern of basecamp settlements occurring near permanent water at valley edge locations, and seasonally occupied settlements located in other parts of a river valley, appears to have been practiced in other areas of Illinois as well (Roper 1974, Gregg 1974). Along narrow river valleys, however, the basecamps may occur on the bluff summit rather than in the valley itself (Farnsworth 1973).

Because of the finely made artifacts and artwork, the elaborate burial practices, the large mounds and earthworks, and the concentrated habitation sites associated with Middle Woodland, the period has probably received more archaeological attention in the Midwest than any other. Recently, however, attention has shifted from recovering elaborate artifacts to investigating the subsistence base, settlement distributions, and organization of populations, as well as interactions between groups in widely separated areas. Although heuristic models for Middle Woodland social and economic organization have been proposed, much work remains to be done to clarify the significance of regional differences and to provide explanations for the first cultural climax (Willey 1966:279) of the Eastern Woodlands area.

There are several reasons why it is especially important that Middle Woodland manifestations in the St. Louis area be preserved for future scientific examination. First of all, there appear to be relatively few Middle Woodland sites in the area. This is unexpected given the varied and abundant natural resources of the region. The St. Louis area also centers on the intersection of several major waterways which should have been important transportation and communication routes in Middle Woodland times. Secondly, it is important that Middle Woodland manifestations of the St. Louis area be examined in order to clarify their relationships with the social developments which either grew out of them or replaced them in the area; for the cultural systems which follow Middle Woodland in the St. Louis area are the most complex developments in the region and are unique in the prehistory of the United States.

The *Late Woodland* period has been characterized as a time of cultural decline following the "elaborate" Middle Woodland systems. While it is true that the esthetically pleasing artistic and craft work, the large mounds and earthworks, and rank structured mortuary situations are no longer found during Late Woodland times, the period should probably not be considered one of decline but rather one of realignment. There appear to be more sites and a larger population during the Late Woodland and settlements occur in a greater variety of locations.

While some archaeologists think that the change from Middle Woodland to Late Woodland was brought about by a deteriorating climate (Griffin 1960), others have suggested that the new alignments were produced by the development of a new subsistence system based on maize agriculture (Farnsworth 1973, Fowler and Hall n.d.). Following the latter argument, communities which adopted the use of maize became more self-sufficient in subsistence and no longer needed to rely on the exchange systems which focused on communities controlling rich bottomland resources. There is presently little evidence, however, for the occurrence of maize in early Late Woodland sites (Kuttruff 1974).

Few studies of Late Woodland subsistence and settlement organization have been attempted. Although Late Woodland sites are widespread throughout the Midwest, they have received little archaeological attention, perhaps partly because they do not yield the elaborate artifacts which can be found at the earlier Middle Woodland and later Mississippian sites.

Late Woodland peoples in the Illinois area were evidently primarily gatherers and hunters who focused their subsistence activities on hunting deer and small animals and collecting nuts and seeds along the many large and small streams. In some areas where a number of seasonally available resources occurred in close proximity, Late Woodland villages could be occupied throughout the year and had smaller settlements nearby which were probably occupied seasonally (Kuttruff 1974). In other areas settlements appear to have shifted with the seasons in order to allow for the collection of more dispersed resources (Geier 1973).

In areas where broad river valleys exist, there is evidently a shift in settlement location from the Middle Woodland to the Late Woodland periods. During Middle Woodland times habitation sites and camps were located only in bottomland contexts (Struever 1968, Munson 1971, Dudzik 1974), but Late Woodland sites occur in upland situations as well as in bottomland areas (Munson 1971, Dudzik 1974). This shift in settlement location suggests that the Late Woodland period witnessed a new emphasis on upland resources. Rather than being animal or vegetable, however, the new resource may have been the easily tilled, rich, loess soils found along the uplands bordering the large river valleys.

Obviously much of the preceding discussion is speculation and there is a great deal of work that needs to be done in order to explicate the changes in settlement and subsistence during Late Woodland times. Understanding the factors and processes will be particularly important in the St. Louis area because of the developments there which began toward the end of the Late Woodland period and progressed into the later Mississippian period. By at least A.D. 900 and possibly as early as A.D. 600 (Fowler 1974) maize agriculture had become an important aspect of the subsistence activities of Late Woodland groups in the American Bottoms near St. Louis. It is the relationship between this increasingly large, agricultural Late Woodland population and the subsequent or possibly contemporary Mississippian occupation which currently presents some of the most intriguing questions for Midwestern archaeologists. Although there are many Late Woodland sites in the Midwest, those of the St. Louis area must be considered unique because of what they (may) will reveal about the development of Mississippian culture.

MISSISSIPPIAN

The term Mississippian derives from the recognition in the early 1900s that a distinct cultural tradition had existed in the area of the central Mississippi River Valley (Holmes 1903). In the St. Louis area the Mississippian period began about A.D. 900 and lasted until around A.D. 1400. In the lower Mississippi River Valley and other areas of the southeastern United States, societies having a Mississippian-like culture persisted into the historic period. Sites related to the Mississippian tradition are found along river valleys from the Gulf of Mexico into Wisconsin and from Oklahoma to Georgia. It is in the broad floodplain setting of the American Bottoms just east of the City of St. Louis that Mississippian culture reached its most complex form.

Mississippian subsistence activities focused on maize agriculture but also included the collection of supplementary wild plant and animal resources. The dense Mississippian populations were concentrated in ecotone areas which provided wide expanses of floodplain soils for agriculture and also access to other resource zones containing plant, animal, and mineral resources (e.g. Peebles 1970, Larson 1971, Gregg 1972, Fowler 1974, Benchley 1974).

Mississippian settlement systems were generally organized in a hierarchical fashion with large, permanent central towns or villages surrounded by smaller farmsteads and supportive camps in a variety of habitats. Many Mississippian sites also reveal a hierarchical organization within the community. Settlements tend to be organized around a central plaza or courtyard with public buildings and the houses of nobles and the dead on top of mounds nearby. Variations in the rank and wealth of persons within the communities are reflected both in the location and size of dwellings and in the treatment of individuals at death.

As in the earlier Middle Woodland period, there is evidence for a widespread redistribution of materials and artifacts between groups and across widely separated regions. Resources which were exchanged include finished artifacts and commodities such as salt; stone for hoes, projectile points, and ground stone tools; marine shell; copper; and probably hides, feathers, wood, and foodstuffs. There is some evidence from the historic period which suggests that the exchange and distribution of goods may have taken place by means of actual traders or merchants (Swanton 1911:78). Fortifications around many Mississippian villages and towns suggest that there was also competition for resources or property either among Mississippian communities or between Mississippian and surrounding Woodland peoples.

Mississippian apparently developed in the central Mississippi River Valley out of an agricultural Late Woodland base as population sizes continued to increase and as maize farming techniques became adjusted to bottomland soils. Some archaeologists, however, feel there is evidence that Mississippian peoples moved into the area from the lower Mississippi River Valley (O'Brien 1969, Porter 1969) and even from Mexico. Sites in the St. Louis area which were occupied during the transition from Late Woodland to Mississippian are therefore extremely important for investigating the transformation of society from village farming groups into what appears to be a unique, urban state. Regardless of the question of origins, there is no doubt that the American Bottoms became the location for the largest and most complexly organized population center in all of pre-Columbian North America north of central Mexico.

One archaeological site near the center of the Bottoms, the Cahokia Site, grew into the largest settlement in the region (and in the United States), covering an area of six square miles and housing a population estimated at around 40,000 people (Fowler 1969, 1974; Gregg 1971). There were over 100 mounds at Cahokia which served a variety of purposes. The largest, Monks Mound, is a rectangular mound which covers 15 acres, rises in four terraces to a height of 100 feet, and supported a large public building at its summit. Many other square or rectangular, flat-topped mounds also served as platforms for buildings which were houses for the elite, public structures, and buildings in which the dead were stored until they were permanently buried. Other mounds served as burial mounds and site limit markers (Fowler 1969). Several major plaza areas and their surrounding mounds and habitation areas occurred within the settlement (Fowler 1974). The central portion of the Cahokia site was surrounded by a massive wooden palisade wall which was evidently used in defense of the settlement. Other large wooden structures included circles of posts which seem to have been sighting devices in a calendrical system and a rectangular enclosure of an undetermined function. The massive architecture and public works along with the evidence of extreme status differentials in burial contexts suggest that the social-political system at Cahokia consisted of social classes and a political elite which directed productive, economic, and religious activities at the site and possibly throughout a larger territory. Cahokia can be considered the first city on the Mississippi River and it was the only one until the growth of the modern communities of New Orleans and St. Louis.

In addition to the central Cahokia Site, the Mississippian occupation of the American Bottoms and bordering bluffs was comprised of a number of different settlement types including towns, villages, hamlets, and farmsteads. The three largest settlements were located at a distance from Cahokia, one to the north under the present town of Mitchell, one to the west under the City of East St. Louis, and one just beyond the southern limits of the American Bottoms outside the city of Dupo. Two other large settlements which were probably under the control of Cahokia were situated in the uplands, one on the bluff tops under the present City of St. Louis, and the other 15 miles east of the American Bottoms at the edge of the prairie in the Illinois Uplands (Fig. 11). Smaller Mississippian communities were located along the bottomlands of streams and rivers which are tributaries of the Mississippi River in Missouri and Illinois.

In addition to questions regarding the development, rise, and persistence of the Mississippian communities in the St. Louis area, archaeologists are currently beset with questions about the disappearance of Mississippian peoples. By the time the French arrived in the region during the seventeenth century, there were no more "Mississippians" and the Indian inhabitants were evidently newcomers without any traditions about the decaying prehistoric remains around them. There is very little archaeological data on the terminal dates, events, and processes of decline of the Mississippian communities. Late prehistoric sites will be important for gaining some understanding of when and why the Mississippian period ended.

The Mississippian settlements in the St. Louis region closely parallel the distribution and form of the modern metropolis with its central city, suburbs, and rural areas. Unfortunately, the similarities in site locations have resulted in the destruction of many large and small Mississippian sites. Only a few of the sites are currently protected and the continuing growth and spread of urban and recreation areas around St. Louis pose a major threat to these extremely important and unique cultural resources. There are no higher priority archaeological resources than the Mississippian sites in and around St. Louis.

PRIORITIES

The preceding discussion has examined the archaeological resources in a broad region in order to evaluate the significance of archaeological remains in the St. Louis area. Important archaeological resources were noted according to their temporal placement. The following summary presents important, high priority archaeological resources in relation to three categories of significance. The first category involves archaeological resources which are unique to the St. Louis area and includes resources which are important for understanding the significance and development of the unique resources. The second category involves resources which are scarce in the larger region around St. Louis and which are therefore important wherever they occur. The third category involves archaeological resources which have a high likelihood of being preserved or only slightly damaged by modern land-use practices and thus provide the archaeologist with the possibility of studying a great range of problems. The high priority resources of the St. Louis area are:

1. *Resources unique to the St. Louis area -* Mississippian, Transitional Late Woodland-Mississippian, Late Woodland, Middle Woodland, chert quarries.

2. *Resources scarce in the larger region -* Paleo-Indian, Early Woodland, burial areas.

3. *Resources with high likelihood of preservation -* rockshelters or caves, talus slope sites.

ST. LOUIS AREA ARCHAEOLOGY

DATA BASE

The data for this archaeological overview of the St. Louis area consists of those archaeological sites which are recorded in the files of the Missouri Archaeological Society in Columbia, Missouri and in the files of the Illinois Archaeological Survey both at the University of Illinois-Urbana and at the Illinois State Museum in Springfield, Illinois. No attempts were made to examine site collections, visit site locations, discover new sites, or to incorporate information on known sites which for one reason or another had not been recorded in the state files. Supplementary information on sites in the files relating to site location, cultural-temporal placement, and site condition was gathered from published reports. Table 1 presents the number of reported sites by county and Fig. 9 displays the densities of known sites across the area by 25 km^2 units.

During the course of the research it became evident that there were substantial differences between the Missouri and Illinois files, particularly in relation to the origins of the data (Table 2). Sites recorded in the Missouri files were reported for the most part by amateur archaeologists through the efforts of the Missouri Archaeological Society. A few professional surveys beginning in the 1930s and continuing until the early 1970s also contributed information on site locations, particularly in Jefferson and Franklin counties. On the other hand, the majority of sites in the Illinois files were reported by professional archaeologists. Most of the sites reported by professionals were located as the result of survey programs which began in the late 1940s and continue through the present. Because the surveys in Illinois are constantly adding new sites to the files, it was necessary to restrict the data utilized in this study to those sites which had been incorporated into the files at the Illinois State Museum by the summer of 1974. As a result only sites reported through the 1972 survey season have been considered.

In addition to the different ways which the files were compiled in each state, there was a significant difference in the nature of the cultural-temporal data in the files. Both the professional and non-professional reports in the Missouri site files seldom attempted to place sites in a temporal framework. In many cases, however, enough descriptive data were included in the files for the author to place sites in one or more temporal categories. In Illinois investigators frequently assigned temporal-cultural labels to sites, but the files seldom provided enough descriptive information for the labels to be confirmed. It is known, for example, that some professionals in Illinois assigned Archaic labels to sites which had no diagnostic artifacts for any period (Munson 1971:5). Because it was impossible to evaluate the reliability of the temporal-cultural assignments in the files, all sites which were labeled with a meaningful temporal designation or which could be assigned to a temporal period on the basis of artifact descriptions were used in the following analysis, regardless of the professional or non-professional status of the individual reporting the site.

Although there have been professional surveys in both states, there has been no systematic survey of any large portion of the study area. Surveys have tended to focus on river or large stream valleys and their immediately adjacent uplands. Those areas which have been surveyed to some degree by professional archaeologists are shown in Figure 10. Major regions within the study area which have evidently received no professional attention include the Missouri Uplands, the Mississippi River Bottom-North, and the Missouri River Bottom. Furthermore, little if any of the upland areas away from major waterways has received professional survey attention. These survey biases produce an impression that archaeological sites do not occur along minor drainages or in most upland areas. Only systematic survey in these zones in the future can reveal if this is, in fact, the case.

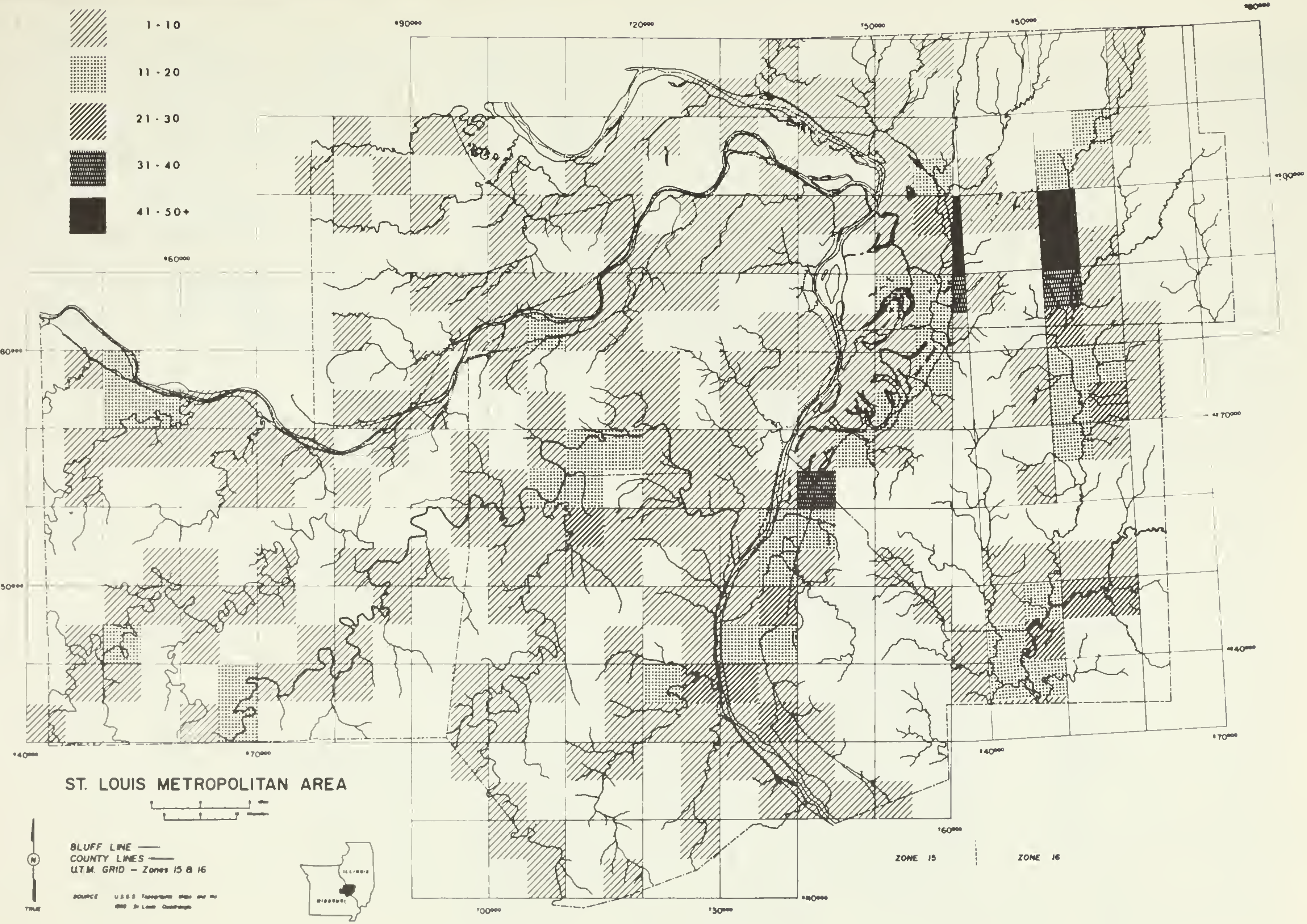

FIGURE 9. Overall densities of known archaeological sites by 25 km^2 units.

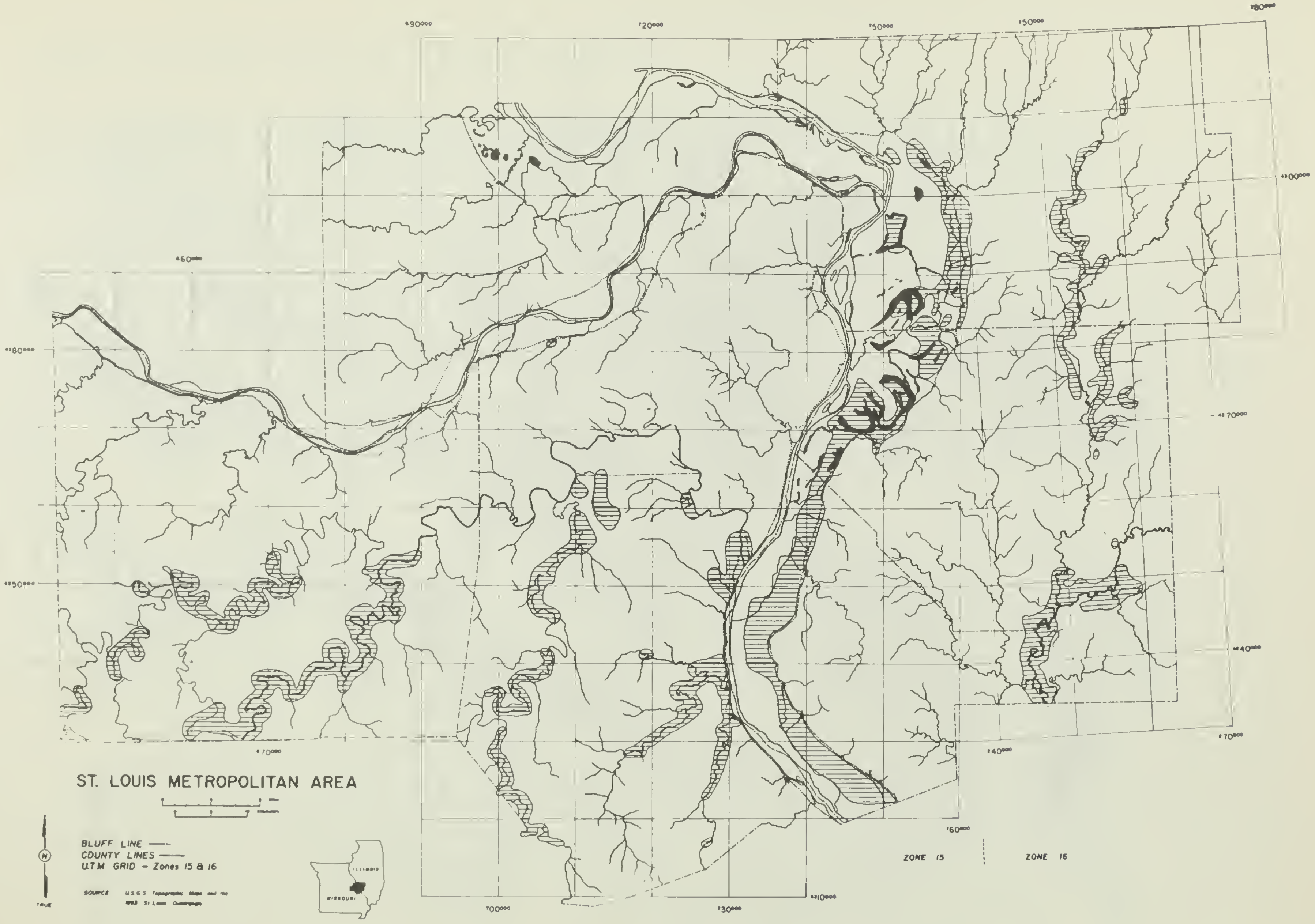

FIGURE 10. Areas which had been at least partially surveyed by professional archaeologists as of 1972.

TABLE 1. Number of Sites by County and State.

State	County	No.	Total
Missouri			717
	Franklin	223	
	St. Charles	64	
	St. Louis	166	
	Jefferson	264	
Illinois			987
	Madison	379	
	St. Clair	332	
	Monroe	276	
Total			1704

TABLE 2. Source of Site Report [1].

	Professional	Amateur	Archival	Total
Missouri	41	57	2	100
Franklin	55	45	0	100
St. Charles	2	92	6	100
St. Louis	13	84	4	100
Jefferson	56	42	2	100
Illinois	94	5	1	100
Madison	91	8	1	100
St. Clair	94	5	1	100
Monroe	99	1	0	100

[1] Figures are percent by county.

Most professional surveys have been for inventory purposes and were extensive in an attempt to locate as many sites as possible over a wide area in a short period of time. The traditional pedestrian techniques used in the surveys only reveal archaeological sites which are visible on or above the surface. Thus sites containing mounds, or cut by roads or erosional gullies, or which have been freshly plowed are the most likely ones to be located. However, traditional survey techniques cannot reveal sites in areas which are covered by natural vegetation, crops, water, or recent alluvium. As a result there are undoubtedly many unreported sites even within areas which have been surveyed.

In addition to the bias created by the inadequacy of traditional surveys to locate sites in many contexts, another bias is created in the way that survey results are traditionally reported. Although locations of sites are recorded in the files and in professional reports, those areas which were intensively surveyed but revealed no evidence of archaeological remains are seldom recorded. As a result, it is impossible to determine if there are any areas or topographic settings that do not contain archaeological sites.

Even with the drawbacks of traditional surveying techniques, the productivity of an extensive archaeological survey conducted over a period of time can be startling. In the Illinois Uplands region, for example, there were three reported sites along Silver Creek in Madison County in 1965. After three seasons of survey work in the dry, cultivated areas immediately adjacent to the stream, 204 archaeological sites were located in an area 25 miles long. In the descriptions of known site locations which follow, then, there will be a heavy and perhaps unwarranted emphasis on those areas and topographic settings which have received the most intensive archaeological attention.

The reliability of the locational information for sites in the files is difficult to assess. In general, data on site location has improved in quality through time. It was found, however, that sites reported by professionals were not necessarily located more accurately than those reported by non-professionals. Sites were excluded from the descriptions that follow if they could not be plotted with some degree of confidence in their grid location and topographic setting. Figures which display site density and site destruction data, however, include all sites which could be plotted within a quarter section (1/4 mile).

PROCEDURES

The primary source of information on the archaeological resources of the St. Louis area was the state files on archaeological sites. The files provided information on site location, temporal assignment, function, and the condition and owner of the site when the report was written. On the basis of the locational data in the files and supplementary information from published reports, the sites were plotted on U.S.G.S. topographic quadrangle sheets. Data on physiography, topography, and water resources were extracted from the topographic sheets. If the topographic sheet contained land-use information which was more recent or more complete than the site report, then data on the "present" condition of the site was also taken from the sheet. Information on the pre-modern vegetation of the study was derived from the plats accompanying the nineteenth century U. S. Land Survey Notes for Missouri and Illinois. These documents are on file in the offices of the state archivist in each state.

Data on each site was coded into a two-card file. Appendix I provides a summary of the code format. Sorting and cross-tabulations were accomplished through the use of the UNIVAC 1106 computer at the University of Wisconsin-Milwaukee under the sponsorship of the UW-M Archaeological Research Laboratories. For the purposes of this report the data were sorted by temporal periods in order to reflect the variability of the archaeological record. Sites which could not be assigned any temporal placement were omitted, and sites which revealed evidence of having been occupied during several periods were tabulated more than once. As a result, the descriptions which follow reflect numbers of archaeological site components rather than actual numbers of sites. Table 3 lists the number of archaeological sites (components) by time period.

In the following descriptions various terms are used which refer to the frequencies of sites by time periods within particular settings. *Minimal* means that less than 5% of the sites from that time period occur in a setting, *minor* means that 6-10% of the sites from a time period occur in a setting, *moderate* refers to 11-40%, and *major* to percentages of greater than 41%.

SITE DISTRIBUTIONS BY PERIOD

Archaeological sites are found in all of the major physical regions, in all topographic settings, near all types of water resources and in practically all vegetation settings distinguished in the study area. On the basis of the known data it can be said that archaeological sites are more likely to occur in some areas and in some settings than in others, but it should be remembered that there are several areas and types of settings which have never been adequately sampled. As a result, the following discussions and predictions are biased toward those situations which have been productive of archaeological sites in the past and do not necessarily provide accurate portrayals of what may be found in the future.

Figure 9 displays the densities of known archaeological sites across the St. Louis area by 25 km^2 units. The densities in the area of overlap between UTM Zones 15 and 16 have been proportionally adjusted to compensate for the smaller size of the units. The heavy concentration of sites in Illinois along Silver Creek, the Kaskaskia River, and the Mississippi River Valley, while indicating that these areas were optimal locations for habitation in a number of prehistoric periods, is also a reflection of the intensive archaeological survey which has been conducted in these areas. Other concentrations of sites occur along the Meramec and Bourbeuse rivers in Missouri, areas which also have witnessed a number of professional archaeological surveys. The low frequencies of sites in the Mississippi Bottom-North and the Missouri Bottom are probably directly related to the lack of survey efforts in the areas. It is also possible that frequent flooding, shifting river channels, or other factors are not conducive either to prehistoric utilization or site preservation in these areas.

The physical regions of the St. Louis area consist of the Illinois Uplands, Missouri Uplands, Ozark Rim, Ozark Uplands, Mississippi Bottom-North, American Bottoms, Mississippi Bottom-South, and Missouri Bottom. While sites occur in every region, approximately 1/3 of the sites are found in the Illinois Uplands. Moderate numbers of sites occur in the Mississippi Bottom-South, the American Bottoms, the Ozark Uplands, the Ozark Rim and the Missouri Uplands. A minimal number of sites which can be identified as to time period are known from the Mississippi Bottom-North and the Missouri Bottom. As suggested before, the distribution pattern is probably related to the amount of archaeological survey conducted in each region.

Archaeological sites occur in every topographic setting distinguished in this study including: bottomlands; high terraces and talus slopes associated with bottomlands; areas which border the broad valleys of the Mississippi and Missouri rivers (such as bluff face), bluff summit (within 100 meters of the bluff edge), bordering upland (within 1 km of the bluff edge); areas more removed from the major river valleys but located near interior drainages such as interior hill slopes, interior hill summits, interior bluff face, and interior bluff summit; and areas removed from interior drainages called interior uplands. Practically half the total number of sites occur in the bottomland of a river or stream. One-quarter of the sites are located on hilltops or upland areas which border interior drainages. Topographic settings which seldom support archaeological sites include interior uplands, interior bluff summit, bluff face, and talus slope.

Data on the nearest source of water were recorded for each site using information from the U.S.G.S. topographic sheets. Eight kinds of water resources were distinguished: river (Mississippi and Missouri), stream, intermittent stream, lake, slough, spring, sinkhole, and swamp. There were several drawbacks to the procedure which result in the quality of the data on water resources being variable. First of all, the topographic sheets were produced over a forty-year period and many waterways have changed over time either through natural or artificial means. In the American Bottoms a base map published in 1893 was used in an attempt to replicate the premodern distribution of water resources. Unfortunately, base maps dating to this period were not available for other areas. The use of topographic sheets to derive water resource data also resulted in a low number of springs being recorded since these features are seldom noted on the maps. In addition, the coding format did not allow for observations on multiple water resources. The descriptions of site distributions according to their proximity to water, therefore, can only reflect limited associations.

The vast majority of archaeological sites occur near permanent or intermittent streams. Nearly half the known sites are near permanent streams and one-third are near intermittent streams. With the exception of Paleo-Indian, sites from all periods in the Missouri Uplands region are located more frequently on inter-

TABLE 3. Number of Archaeological Components by Time Period.

Period	Number by Specific Period	Number by General Period
Paleo-Indian	11	11
Archaic	352	
Early Archaic	33	
Middle Archaic	0	
Late Archaic	9	
Archaic Combined		394
Woodland	187	
Early Woodland	22	
Middle Woodland	65	
Late Woodland	380	
Transitional	47	
Woodland Combined		701
Mississippian	231	231
Total	1337	1337

mittent streams than on permanent streams. This unusual situation may relate to the lack of intensive survey along permanent streams in the area. Many sites in the Mississippi Bottom-South are also located along intermittent streams. In this case, however, modern water management practices have produced large numbers of intermittent streams in areas which once had permanent streams, lakes, and sloughs. The distribution of sites with relation to water resources in the Mississippi Bottom-South will not be detailed as a result in the descriptions which follow. Less than 1/5 of the known archaeological sites are found near lakes and only a minimal number are found close to major rivers. In only a few instances are sites recorded as having a slough, spring, or sinkhole as the nearest water resource.

The generalized vegetational framework used in this study reveals little change in site setting through time. There are differences between regions, however, since few prairie areas occur in the regions west of the Mississippi and south of the Missouri rivers. In order to assess the vegetational setting, the general proportion of forested and prairie areas within a 3 km radius was calculated for each site location. No sites are located in situations where there is only prairie within 3 km of the site. In Illinois the majority of sites are located where there is some prairie in the area but most of the vegetation is forest in both upland and bottomland contexts. In Missouri, sites are found primarily in woodland situations with only a few sites, particularly in the Missouri Uplands, being located in settings where both prairie and woodland occur.

The following description of site distributions by temporal-cultural period emphasizes those periods which have been previously highlighted as particularly important in the St. Louis area. For example, Archaic period sites have been lumped together and the description of their distributions can only be considered to be of a most general nature. The lumping of Archaic sites was also necessary since it is difficult to make temporal distinctions among Archaic artifact classes, especially on the basis of the information in the state site files. Woodland sites, however, have been subdivided into temporal units when possible and those sites which could be identified only as generalized Woodland have been omitted from the descriptions. The frequencies of site distributions by periods and physical features are summarized in Appendices 2, 3, and 4.

Paleo-Indian

During the Paleo-Indian period all sites are located in upland contexts and are evenly distributed among all the upland regions. Of the 11 identified sites, none are located in the valley bottoms of either major or minor waterways and most occur on interior hill summits or slopes. In terms of water resources, Paleo-Indian sites tend to be located near permanent streams but are occasionally found near intermittent streams and sinkholes. In Missouri Paleo-Indian sites occur in woodland locations removed from prairie openings. In Illinois sites are found in situations where woodland areas predominate or where there is an equal amount of prairie and woodland within a radius of 3 km.

Archaic

The 394 Archaic period sites are distributed throughout all major physical regions of the St. Louis area but only minimal numbers occur in the Mississippi Bottom-North, the Mississippi Bottom-South, and the Missouri Bottom. The major numbers of Archaic sites occur in the Illinois Uplands and moderate numbers are found in the Ozark Rim region. Most of the Archaic sites in the American Bottom are located in the northern half suggesting that the southern half and possibly the Mississippi Bottom-South were areas of unstable land surface and changing river channels during Archaic times.

Archaic sites occur in all topographic settings except for the bluff face along the major river bottoms. In the Illinois Uplands where most Archaic sites occur, the major number of sites are located on hill summits along the Kaskaskia River and Silver Creek drainages. Archaic sites are also found in the bottomlands, along the uplands bordering the Mississippi Valley, and on the slopes of hills in the Illinois Uplands; no Archaic sites are reported from interior upland locations nor are any associated with bluffs along interior drainages. In Missouri a large part of the Archaic sites are located on interior hill slopes or summits and along the bottomlands of interior waterways such as the Meramec, Bourbeuse and Big rivers, and Joachim Creek. In the Missouri Upland region one-third of the sites border on the major valleys and in both the Missouri Uplands and the Ozark Rim, Archaic sites can be found in interior upland settings away from stream valleys.

Practically all Archaic sites are situated near either a permanent stream or an intermittent stream in approximately equal proportions within each physical region. In the American Bottoms, however, Archaic sites may have a lake or swamp as their nearest water resource and, in the Missouri Uplands, Archaic sites are found situated close to a major river. A few Archaic sites are also found near small lakes in the Illinois Uplands and near sinkholes in both the Illinois and Ozark uplands.

In the Illinois Uplands two-thirds of the Archaic sites are located in a setting where woodland predominates over prairie but both vegetation zones occur in the site area. The second most prevalent vegetational setting is characterized by more prairie than woodland within 3 km of each site, but less than one-fifth of the sites occur in this context. In all the upland areas of Missouri the vast majority of Archaic sites occur in purely woodland contexts. In the American Bottoms approximately half the Archaic sites occur in settings which contain more woodland than prairie and, like the Illinois Uplands, the next most common setting is composed of mostly prairie vegetation.

Early Woodland

Woodland period sites are distributed in a number of different physical regions and show differing distributions through time. Twenty-two sites have been identified as belonging to the Early Woodland period. Early Woodland sites are absent from the Missouri Uplands, the Mississippi Bottom-North, and the Missouri Bottom. The major percentage of Early Woodland sites occur in the Mississippi Bottom-South and moderate numbers of sites are found in the American Bottoms. Two Early Woodland sites have been identified in the Ozark area of Missouri, one each in the Rim and the Uplands. Both are rockshelter or cave sites and occur near the Mississippi River in the Plattin-Joachim drainage.

Early Woodland sites occur primarily in bottomland settings along the Mississippi River but isolated sites have also been recorded in a bottomland context in the Kaskaskia drainage of the Illinois Uplands, on a high terrace and talus slope in the American Bottoms, and on interior bluff faces in the Ozark area. Water resources associated with Early Woodland sites in the bottoms are primarily permanent streams.

Early Woodland sites tend to occur in areas which provide mostly woodland vegetation with some prairie nearby. In the Mississippi River bottomlands, however, some sites are found in situations where there is more prairie than woodland and, in Missouri, Early Woodland sites occur in locations which provide only woodlands.

Middle Woodland

Although the number of sites during Middle Woodland times increases to 65, they are not found in every physical region. The American Bottoms has the greatest percentage of sites and the American Bottoms and Mississippi Bottom-South together contain over half the known Middle Woodland sites in the St. Louis area. Middle Woodland sites are absent from the Mississippi Bottom-North and only minimal numbers are found in the Missouri Bottom and the Ozark Uplands. The Ozark Rim contains a minor number of sites and all other regions display moderate numbers.

Middle Woodland sites can be found in practically every topographic setting except for interior uplands and interior bluff face. The majority of sites are located in bottomlands associated with the Mississippi River, but they also occur in the bottomlands of interior drainages such as the Kaskaskia River in the Illinois Uplands and along the Meramec River and its major tributaries in Missouri. A few Middle Woodland sites also occur in the upland areas adjacent to the major river valleys.

The principal water resources associated with Middle Woodland sites are permanent streams which total nearly one-half of the water resources in all areas except the Missouri Uplands. A greater percentage of sites are located on lakes, than in the preceding periods, especially in the American Bottoms.

In terms of vegetation, bottomland sites along the Mississippi River tend to be located in areas which contain more forest than prairie but moderate numbers of sites are located in areas where the amount of woodland and prairie is almost equal. In the Illinois Uplands most Middle Woodland sites are found in areas which have more woodland than prairie in the site area. The Missouri Uplands witness a shift in site location from Archaic, with Middle Woodland sites being located more frequently in areas which contain some prairie. The majority of sites, however, are still found in areas which contain only forest vegetation.

Late Woodland

Three hundred eighty archaeological sites have occupations which have been assigned to the Late Woodland period and, like Archaic sites, they are distributed throughout all physical regions in the St. Louis area. Although a major percentage of Late Woodland sites are located in the Illinois Uplands, a larger proportion of these sites is found in the Mississippi Valley than during the preceding Archaic period. Moderate numbers of sites occur in the American Bottoms and Mississippi Bottom-South. Late Woodland sites occur in minor amounts in the Ozark and Missouri uplands and minimal numbers are found in the Mississippi Bottom-North, the Missouri Bottom, and the Ozark Rim.

Archaeological sites are found in all topographic settings in Late Woodland times and the site distributions are similar in some ways to those of the Archaic Period. In the Illinois Uplands sites occur most frequently on the upland or hill summits near the Kaskaskia River and Silver Creek as in the Archaic. Unlike the Archaic period, however, two other settings frequently reveal Late Woodland sites, the bottoms associated with interior drainages and the summits of the bluffs bordering the Mississippi Valley. In the American Bottoms and the Mississippi Bottom-South over 90% of the Late Woodland sites occur on the bottom itself but a few sites have also been located on high terraces and talus slope areas. In the Ozark Uplands the major number of sites occur on bottomlands associated with the Meramec, Bourbeuse, and Big rivers and Plattin and Joachim creeks. A moderate number of Late Woodland sites have also been located on interior bluff faces and are associated with rockshelters or caves. In the Missouri Uplands Late Woodland sites are fairly evenly distributed across bottoms, interior hill slopes, interior hill summits, and bluff summits bordering the major river valleys. A few Late Woodland sites have also been found in the interior uplands.

Late Woodland site distributions in relation to water resources indicate that the trend toward settling near lakes which was noted during the Middle Woodland period is continued in the American Bottoms and the Mississippi Bottom-South. The greater percentage of sites in the Illinois Uplands, however, indicates that an increasing variety of site locations were utilized during the Late Woodland period and lake resources were not necessarily of primary importance. In the Illinois Uplands the major proportion of sites are located near permanent and intermittent streams with a minor number of sites located near other kinds of water resources such as small lakes,. sloughs, swamps, and sinkholes. In the American Bottoms practically half the Late Woodland sites are situated close to lakes and moderate numbers of sites occur on permanent or intermittent streams. In the Mississippi Bottom-South lake and swamp locations together account for one-third of the water resources with streams and intermittent streams each exhibiting one-third of the sites located in the Bottom. In the Missouri Uplands, as in most other time periods, sites are usually located near intermittent streams. In the Ozark Uplands, on the other hand, the vast majority of sites occur near permanent streams.

In the Illinois Uplands over three-fourths of the Late Woodland sites are found in settings where woodlands predominate but where some areas of prairie occur within 3 km. Unlike the Archaic period, only a minor percentage of sites are located in areas where there is more prairie than forest. In the American Bottoms three-fourths of the known Late Woodland sites are also located in areas where woodland predominates over prairie. Most of the remaining sites, however, are situated in areas where there is either an equal amount of woodland and prairie or where prairie predominates. In the Mississippi Bottom-South approximately one-half the sites are located in areas dominated by woodland and one-third of the sites occur in areas where prairie covers half or more of the nearby areas. In Missouri the vast majority of sites are located in completely wooded areas but, in the Missouri Uplands, the second highest percentage of sites occurs in areas which contain half prairie and half woodland. A few sites in the other upland areas of Missouri also occur near prairie openings. The emphasis in Missouri on areas containing prairie thus continues from Middle Woodland times.

Transitional

There are 47 sites which may be transitional between the Late Woodland and Mississippian periods in the greater St. Louis area. These have been identified by the author on the basis of their yielding particular kinds of pottery (presence of limestone temper and red slipping, absence of shell-tempered ceramics). Unlike Late Woodland sites, the transitional sites are found primarily in the Mississippi Bottom-South and in moderate amounts in the American Bottoms. There are no transitional sites in the Mississippi Bottom-North or in the Missouri Bottoms. A few transitional sites occur in the various uplands of Missouri and Illinois, for the most part in areas which are later dominated by Mississippian occupations.

Transitional sites are located primarily in the bottomland areas of the large river valleys and in the bottomlands along the Kaskaskia River in the Illinois Uplands. In Missouri transitional sites occur on high terraces, talus slopes, and in the uplands bordering the major river valleys.

The majority of transitional sites occur in the Mississippi Bottom-South along what are now intermittent streams but moderate percentages of sites also occur near lakes and permanent streams. In the American Bottoms the majority of the sites from this period occur near lakes and none are located near intermittent streams. In practically all other regions where these sites occur they are located near intermittent or permanent streams.

The vegetational setting of transitional sites in the Mississippi Bottom-South reveals that almost half are located in areas where woodland predominates over prairie, and one-third of the sites occur in areas where prairie predominates over woodland, as in Late Woodland times. In the American Bottoms, however, sites tend to occur more frequently in predominantly prairie settings than in the earlier period. Over half the sites occur in areas where there is more prairie than woodland and the remainder of sites lie in areas which contain mostly woodland with some prairie. In the Illinois Uplands sites are located either in situations where there is more woodland than prairie or all woodland. In the Missouri regions transitional sites occur only in woodland areas. It appears that in contrast with Late Woodland, what appear to be transitional sites not only are concentrated in the large bottomland areas but tend to focus on wooded areas when they do appear in the uplands in Missouri. The trend toward sites being located in wooded upland areas is continued into the Mississippian period.

Mississippian

The 231 known Mississippian sites are distributed throughout all physical regions except the Mississippi Bottom North, although they occur only in minimal amounts in the Missouri Bottom. The Missouri Uplands and the Ozark Rim have yielded only minor numbers of Mississippian sites. Moderate numbers of sites are found in the remaining physical regions with the American Bottoms containing the greatest number of sites.

Mississippian site distributions focus on the broad river bottoms and bordering bluffs along the Mississippi River and on the bottomlands of the larger streams which lie near the Mississippi. In the Illinois Uplands almost half the Mississippian sites are located on the uplands near the Kaskaskia River and Silver Creek drainages and one-fifth of the sites occur along the bottoms of the streams. Over one-quarter of the sites are found along the uplands bordering the Mississippi River suggesting that the primary focus of Mississippian occupation was on the Mississippi bottoms region. In the upland regions of Missouri the majority of Mississippian sites are located along the bottomlands and, in the Ozark Upland, 80% of the sites are located in this context, primarily along the Big River and the lower reaches of the Meramec River. In the Missouri Uplands and the Ozark Rim one-fourth of the Mississippian sites occur in the upland areas bordering on the major river valleys. Mississippian occupations in Missouri are also found on interior hill summits and slopes and in caves and rockshelters in the Ozark areas.

Mississippian sites occur near a variety of water resources but, after streams and intermittent streams, lake locations appear to have been particularly important. In the American Bottoms nearly half the sites occur near lakes and over one-fourth are found near permanent streams. In the Illinois Uplands half the known Mississippian sites are found along permanent streams and one-third are located near intermittent streams. The remainder of sites in the uplands occur near lakes. In the Missouri Uplands a moderate percentage of sites also occurs near lakes but the majority of sites are found along intermittent and permanent streams. In the Missouri Uplands and the Ozark Rim some Mississippian sites are also located closest to a major river.

Mississippian sites in the American Bottoms are found primarily in areas which contain more forest than prairie. Approximately one-third of the sites, however, occur in areas which have either equal amounts of prairie and woodland or more prairie than woodland suggesting an increased stress on prairie areas from Late Woodland times. In the Mississippi Bottom-South two-thirds of the sites occur in areas dominated by forest but moderate numbers of sites occur where prairie is predominant. The percentage of sites in areas which are half or more prairie is less than for Late Woodland sites. In the Illinois Uplands the majority of sites occur in areas which are mostly woodland. Only minor numbers of sites occur in areas where there is more than half prairie or where there is only forest. In the Illinois Uplands a smaller percentage of sites are located in areas which are dominated by prairie than was the case during Late Woodland times. The trend for settlements to be located in upland wooded areas is continued in Missouri where only one site in the Missouri Uplands occurs near a prairie. All other Mississipian sites in Missouri are located in wooded areas. The move away from prairie areas suggests that prairie or prairie edge resources were no longer as important as in Late Woodland times. The shift of settlements away from the prairie may not indicate that the areas were not being utilized, however. With the increasing importance of agriculture in Mississippian times, prairie areas, particularly in bottomlands, may have been reserved for nonsettlement activities such as farming.

Summary

Archaeological sites from different time periods can be expected to occur in different physical settings in the St. Louis area. Paleo-Indian sites are found only in upland situations and Early Woodland, Middle Woodland, and transitional sites occur most frequently in the broad bottomlands of the major rivers or in the valleys of their large tributaries. Archaic and Late Woodland sites appear in a great variety of regional and topographic settings with Archaic sites occurring primarily in uplands and Late Woodland sites being about evenly divided between bottomlands and uplands. Mississippian sites occur primarily in the bottomlands of both major rivers and larger tributaries. Lesser numbers are found in the uplands bordering the large river valleys and along streams in Illinois. The majority of important archaeological resources, excluding Paleo-Indian, would therefore be expected to occur in the broad bottomlands of the major rivers and in the bottoms of the larger tributary streams. In the Illinois Uplands, however, sites would be expected to occur in the upland areas along tributary streams since the bottoms tend to be wet. An additional expected location of important archaeological resources is along the uplands bordering the major river valleys where Middle Woodland and Mississippian sites tend to occur frequently. Paleo-Indian sites occur in scattered upland settings and their expected distribution is impossible to project in detail.

The distributions of archaeological sites with respect to water resources changes through time only in some physical regions. Very few sites in any period are located near the present course of a major river and most sites are located along a stream or intermittent stream. In the large bottoms the percentages of sites located near lakes increases in Late Woodland and Mississippian times.

The distribution of sites with respect to vegetation varies by region but there is no general pattern of change through time. In Missouri practically all sites from all periods occur in totally wooded contexts; however, during the Middle Woodland period there is a slightly greater percentage of sites located near large bottomland prairies. In the Illinois Uplands almost all sites occur in areas where both prairie and woodland are present. There is, however, a greater percentage of Archaic sites located in areas where half or more of the vegetation is prairie than during any other period. In the Mississippi River Valley the majority of sites tend to occur in areas where there are both woodland and prairie. During all but the Middle Woodland, a substantial percentage of sites are also located in prairie dominated settings. There are no sites in any period or region which are located in situations where only prairie occurs in the surrounding area.

SITE DISTRIBUTIONS BY FUNCTION

No attempt has been made in the preceding description to deal with archaeological resource diversity according to site function by period. Although this kind of information was available for many sites, there was little uniformity in the data and no means of determining how various reporters made decisions in assigning functional terms. In addition, although many sites were occupied during more than one period, in the files sites were invariably only assigned one function which referred to the dominant or latest occupation. Appendix 5 tabulates the total number of site components according to their function as noted in the files and their physical placement by region and topography. The totals include sites which could not be assigned to a particular temporal period.

The following site functions were identified from the site files: *workshop, quarry, rockshelter* or *cave, camp, farmstead, village,* and *burial area.* A few other site functions such as battleground and cache were encountered occasionally but have been omitted from the tabulations. In situations where a site served multiple functions, such as a village with burials, only a single designation was assigned indicating the primary function.

Over 1100 site components were identified as being either camps or villages. It was impossible, however, to determine the criteria by which various investigators classed sites in one category or the other and no concerted attempt to correlate village or camp locations with physical features will be made. The combined percentages of camps and villages are almost identical to the general distributions of sites by component when measured against location by physical region or topography. The similarity suggests that if a site did not exhibit special features, it was generally called either a camp or a village.

Quarries occur almost exclusively in the Ozark Rim on interior hillslopes or interior uplands away from streams. Quarries are the remains of intensive mining activities conducted during the procurement of good quality stone for the manufacture of a variety of tools. The areas are important because they provide data on source materials, tool production processes, and the variety of peoples who exploited the resources through time. The abundant, good quality cherts available in the exposed lower Mississippian limestones in the Ozark Rim were evidently heavily exploited.

Sites which were identified as workshops occur primarily in bottomland settings in the Ozark Rim but also are found in interior uplands and interior hillslopes. These workshop areas were probably associated with the nearby chert quarries. The remainder of the sites identified as workshops occur in the Ozark Uplands, Missouri Uplands, American Bottoms, and Mississippi Bottom-South where they are all located on bottomlands.

Burial areas consisting of cairns, mounds, or graves are found in every physical region of the study area. A site was only designated as a burial area if human bones were found associated with it. Mounds or cairns which did not have such evidence were not classified as to function. Burial areas occur most frequently in the Illinois Uplands but are also found in moderate amounts in the Missouri Uplands, Ozark Rim, and Ozark Uplands. A minimal number of isolated burial areas are also found in the bottoms of the major river valleys. In every upland region except for the Missouri Uplands, most of the burial areas are situated along the bluff summits bordering the Mississippi or Missouri river valleys. In the Missouri Uplands burial areas occur most frequently along the bottomlands of streams or on an interior hillslope or summit.

Over half the identified rock shelters or caves are found in the Ozark Uplands and there they occur primarily along interior bluff faces. Over one-third of the known rockshelters occur in the Ozark Rim region and the remainder are located in the Illinois Uplands. In addition to interior bluff face locations, Ozark Rim shelters are found in moderate amounts on interior hillslopes and the bluff face along major river valleys. In Illinois rockshelters or caves are only known along the bluffs of the Mississippi River.

PROJECTIONS

On the basis of known site distributions in relation to various physical attributes of greater St. Louis, predictions can be made as to what areas are likely to contain concentrations of important archaeological resources. The projections will be presented with reference to the previously established resource priorities by period and function.

Paleo-Indian sites are known to occur in upland situations only and are scattered across the landscape. No pattern to their distribution other than their topographic setting can be discerned from the data and it is therefore impossible to suggest particular areas where Paleo-Indian sites might be expected.

Early Woodland sites are not recognized frequently in the study area. The majority of known sites are located in the bottomlands of the Mississippi River particularly in the southern area but Early Woodland occupations are also known from the bottoms in the Illinois Uplands and from rockshelters in Missouri. Additional Early Woodland sites would be expected to occur in other broad bottomland contexts along the Mississippi and Missouri rivers and also along the Kaskaskia and Meramec rivers.

Middle Woodland sites are more widespread than Early Woodland sites and are situated in the broad bottoms of the Mississippi River from the American Bottoms south along streams and occasionally near lakes. They are found in addition along the bottomlands of streams in the uplands of Illinois and Missouri and along the uplands bordering on the Mississippi and Missouri river valleys. Additional Middle Woodland sites should be expected in the Mississippi and Missouri river valleys near streams and lakes and also in the bottomland areas of the broader interior stream valleys in Missouri and Illinois. In Illinois Middle Woodland sites can also be expected in the uplands near large interior streams.

Late Woodland sites are widespread throughout the St. Louis area. They occur in all physical regions and topographic settings and are frequently found along streams and near lakes. In Illinois Late Woodland sites can be expected along the uplands and bottoms of interior stream drainages, along the bluffs bordering the Mississippi River, and also in the Mississippi bottomlands particularly near lakes. In Missouri Late Woodland sites can be expected along the bottoms of streams and in rockshelters in the Ozark areas. In the Missouri Uplands sites should occur along the hillslopes and summits near streams. Throughout Missouri Late Woodland sites can be expected along the bluffs and bottomlands of the major rivers.

Sites which appear to be transitional between Late Woodland and Mississippian occur primarily in the southern portion of the Mississippi River Valley but sites are also known from the Kaskaskia River area in Illinois and the Big River and Plattin Creek in Missouri. Transitional sites also occur along the uplands bordering the major rivers. Projecting from the known physical distribution of transitional sites, additional sites should be located in the Mississippi and Missouri river valleys and along the larger stream valleys in the uplands of

Illinois and in the Ozark area. Sites might also be expected along the bordering uplands of the major rivers. The known distribution of transitional sites which concentrates on the southern portions of the Mississippi Valley and the Ozark areas, however, may reflect the actual limits of transitional site distributions.

Mississippian sites are concentrated in the American Bottoms, Mississippi Bottom-South, along the larger streams in the Illinois Uplands, and along the lower Meramec River, Big River, and in the Plattin-Joachim Creek areas in Missouri. The sites tend to be located near streams and lakes. Additional Mississippian sites should be expected to occur along the northern bottomland areas of the Mississippi River, along the bottoms of the Missouri River, and along the larger streams in Illinois and the Missouri Uplands. Mississippian sites will also be found in the uplands bordering the major river valleys. In the Ozark Uplands Mississippian sites will evidently not occur much west of the junction of the Meramec and Big rivers.

Prehistoric chert quarries occur primarily in the Ozark Rim south of the Meramec River. The quarries near St. Louis are unique to the area and some of those in the Ozark Rim have already been designated as a National Historic District. Additional quarries can be expected to be found in rocky upland areas where there are outcrops of cherty limestones, sandstones, or hematite.

Known burial sites are distributed thoughout the St. Louis area but are found most frequently along the bluff summits bordering the Mississippi and Missouri rivers. Additional burial locations, particularly in the form of mounds and rock cairns, will undoubtedly be located in these bordering upland areas.

A final priority criteria for archaeological resources in the St. Louis area relates to the likelihood of site preservation. Archaeological sites are likely to be preserved either in areas where modern land practices have not significantly altered the surface as in wooded or steeply sloping areas, or in situations where material evidences of human occupation have been buried and are protected from land surface alterations. Buried sites are likely to occur in areas of rapid natural deposition such as along the base of the loess-capped bluffs bordering the Mississippi and Missouri rivers. Rockshelters and caves are also likely to contain buried sites where repeated human occupations have covered earlier occupations with debris. Rockshelters and caves are also not likely to have been subject to modern land-use. Additional rockshelters and caves can be expected to be located along the large and small streams of the Ozark areas on interior bluff faces and hillslopes.

Figure 11 shows those areas which are either known or projected to have important archaeological resources in the St. Louis area. The distribution of Mississippian sites encompasses the known areas of most other high priority resources such as Early Woodland, Middle Woodland, transitional, and talus slope sites. Other areas of known archaeological significance outlined in the figure include the distribution of Late Woodland sites, mounds, quarries, and rockshelters. The projected areas of archaeological significance include all resource priorities.

RESOURCE BASE

Much of the preceding discussion has been based on the distributions of archaeological sites which have been reported in the past. The growing urban and suburban areas and the agricultural and extractive land-use practices have contributed to the partial or total destruction of many known archaeological sites. Since it is only possible to protect the remaining portions of the prehistoric cultural resource base, it is important to have an understanding of what has been destroyed.

In extracting information from site files and topographic maps regarding the condition of archaeological sites, it was often difficult to assess the extent of site destruction. Many archaeological sites are located as a result of their having been disturbed by plowing activities but it is impossible to determine from these surface indications whether the entire extent and depth of a site has been destroyed. In assessing the amount of destruction for each site it was necessary to make standardized evaluations of the effects of various types of land use on the resource. In general, a site was considered *slightly* (1-25%) damaged if it had been plowed and *moderately* (26-50%) damaged if it was both plowed and eroded or was disturbed by roads and residences. *Extensive* (51-75%) and *extreme* (76-100%) damage to a site could be caused either

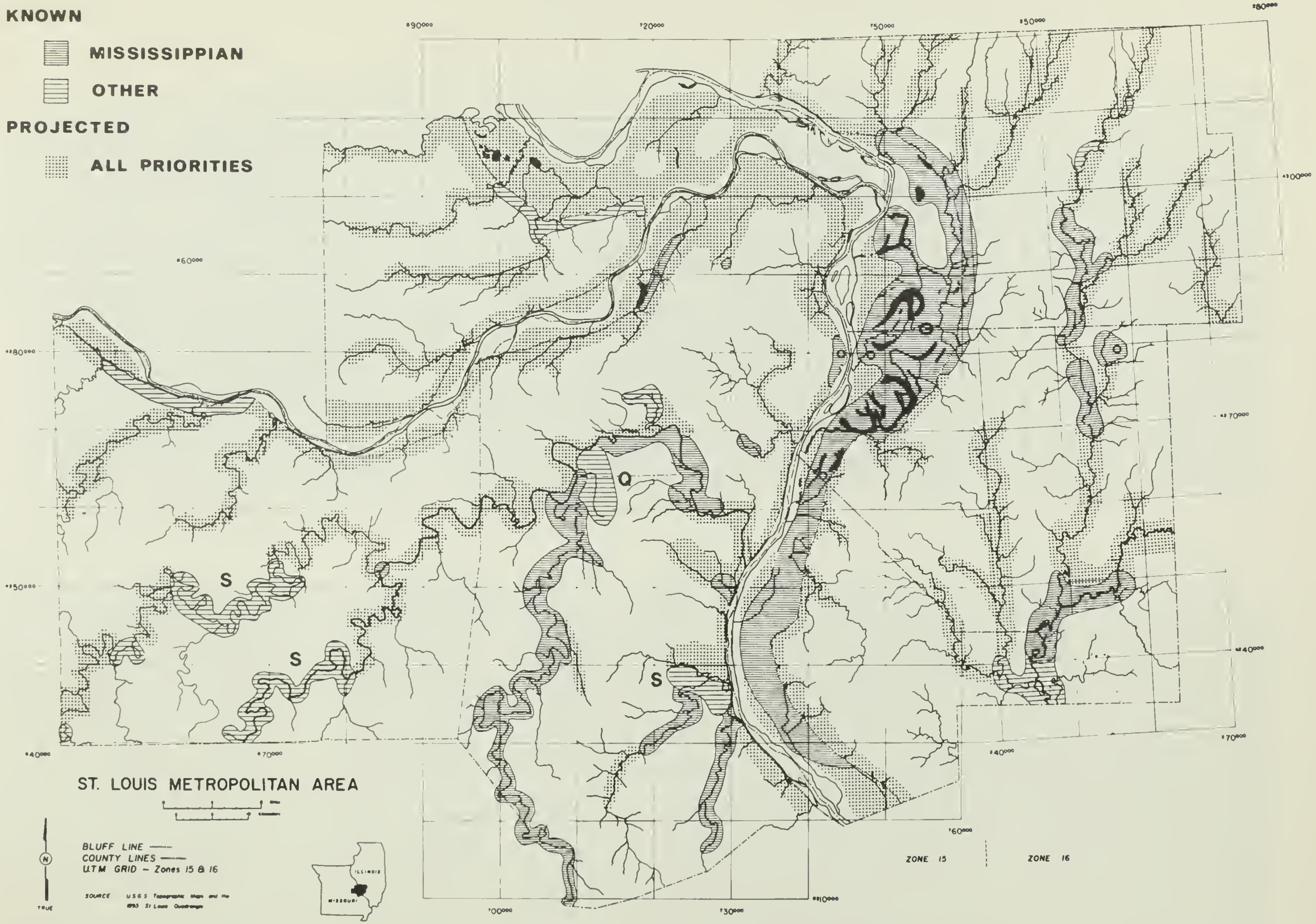

FIGURE 11. Important archaeological resources of the St. Louis area, known and projected. Resources shown include Mississippian site areas, quarries (Q), rockshelters or caves (S), and other resources such as Late Woodland sites and burial areas. The circles in the Mississippi zones indicate large settlements or towns. The largest circle marks the Cahokia Site. Projections into archaeologically unknown areas are for all resource priorities.

by a combination of disturbance factors or by single factors such as mining or highway construction which removed large portions of a site. The evaluations of amount of site destruction, especially in the case of plowed areas, are probably underestimates.

The percentages of undisturbed sites in 25 km^2 units are plotted in Fig. 12, and Fig. 13 shows the distribution of severely disturbed sites (51-100% destroyed). It is readily evident that the archaeological resources in the area of the City of St. Louis and the American Bottoms have been most severely damaged by modern development. Throughout the entire region, however, there are very few known sites which have escaped a certain degree of disturbance. Even so, archaeological resources of these areas should not be given up as lost for what remains of them can still provide answers to many archaeological questions. In some cases, parts of archaeological sites may remain even in intensely urbanized areas such as park locations or areas which have not been subjected to much earth removal. Part of a large Mississippian site, for example, apparently lies buried beneath the fill which keeps the City of East St. Louis above the floodwaters of the Mississippi River. Only in the wooded upland areas of Missouri has site destruction been kept to a minimum. Most of the recognizable undisturbed sites are occupations in rockshelters.

Calculating the amount of site destruction by temporal-cultural period reveals that those resources which have been regarded as being especially important in the St. Louis area have been threatened by land-use practices. Table 4 summarizes the amount of site destruction by period. It is evident from the table that very few sites in any time period remain undisturbed. Paleo-Indian sites have suffered the most destruction which is unfortunate since there are so few sites from the period. Almost one-quarter of the known Early Woodland sites have been severely damaged and there remains a maximum of 17 known Early Woodland sites in the entire area which are at most 50% intact. Mississippian sites have also suffered a considerable amount of destruction with over one-fifth of the sites being severely damaged. Archaic sites seem to have suffered the least amount of severe damage overall. These figures argue strongly for the immediate necessity of developing programs to protect what remains of these very fragile cultural resources.

TABLE 4. Amount of Site Destruction by Time Period.

Period	Number of Sites*	% Undamaged	% Moderately Damaged (1-50%)	% Severely Damaged (51-100%)	Total
Paleo-Indian	10	0	30	70	100%
Archaic	354	2	92	6	100%
Early Woodland	22	0	77	23	100%
Middle Woodland	62	0	84	16	100%
Late Woodland	339	2	85	13	100%
Transitional	45	0	85	15	100%
Mississippian	207	2	78	21	100%

*Number of sites for which information on site condition was available.

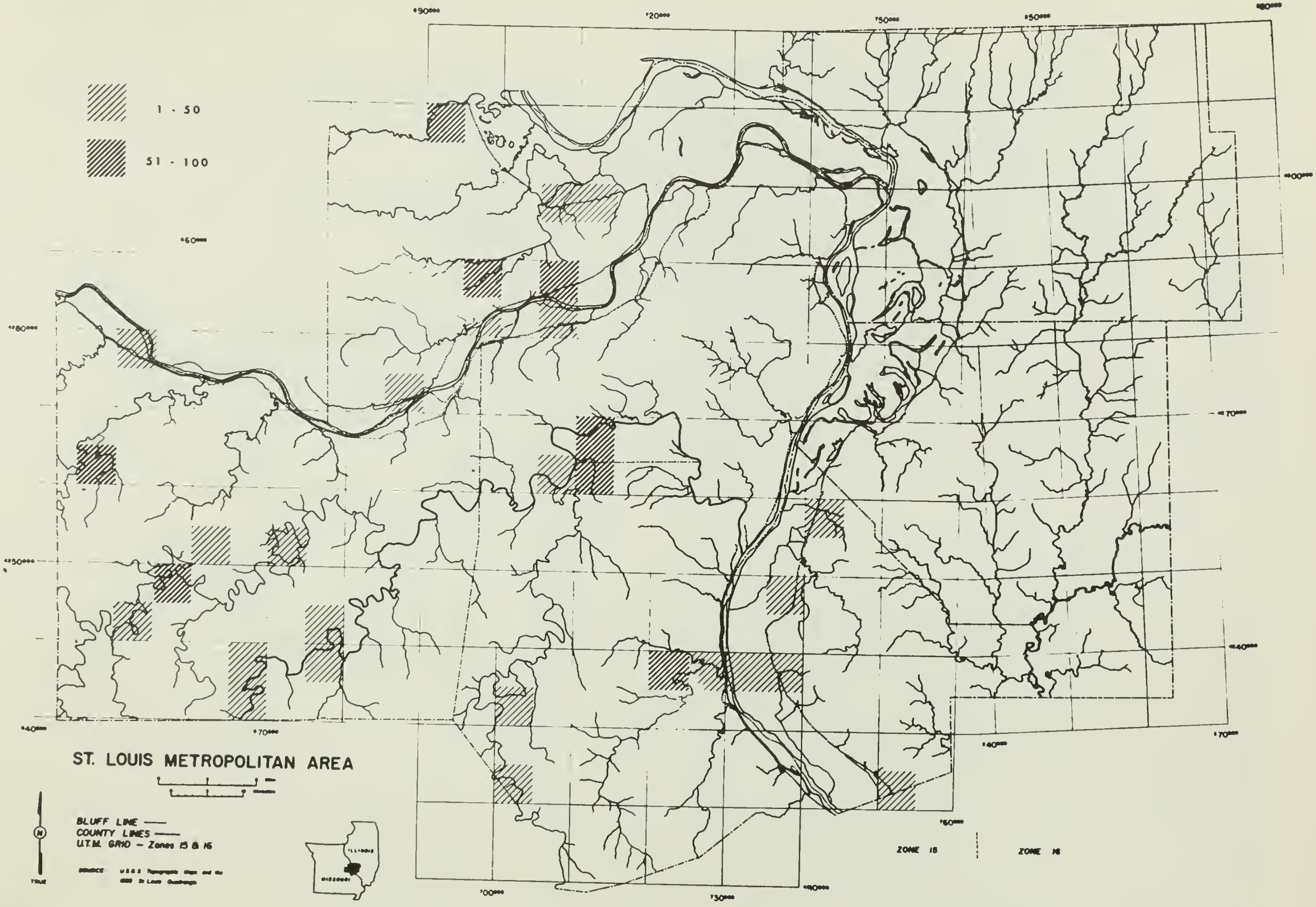

FIGURE 12. Distributions of undisturbed archaeological sites by percentage of sites within each 25 km^2 unit.

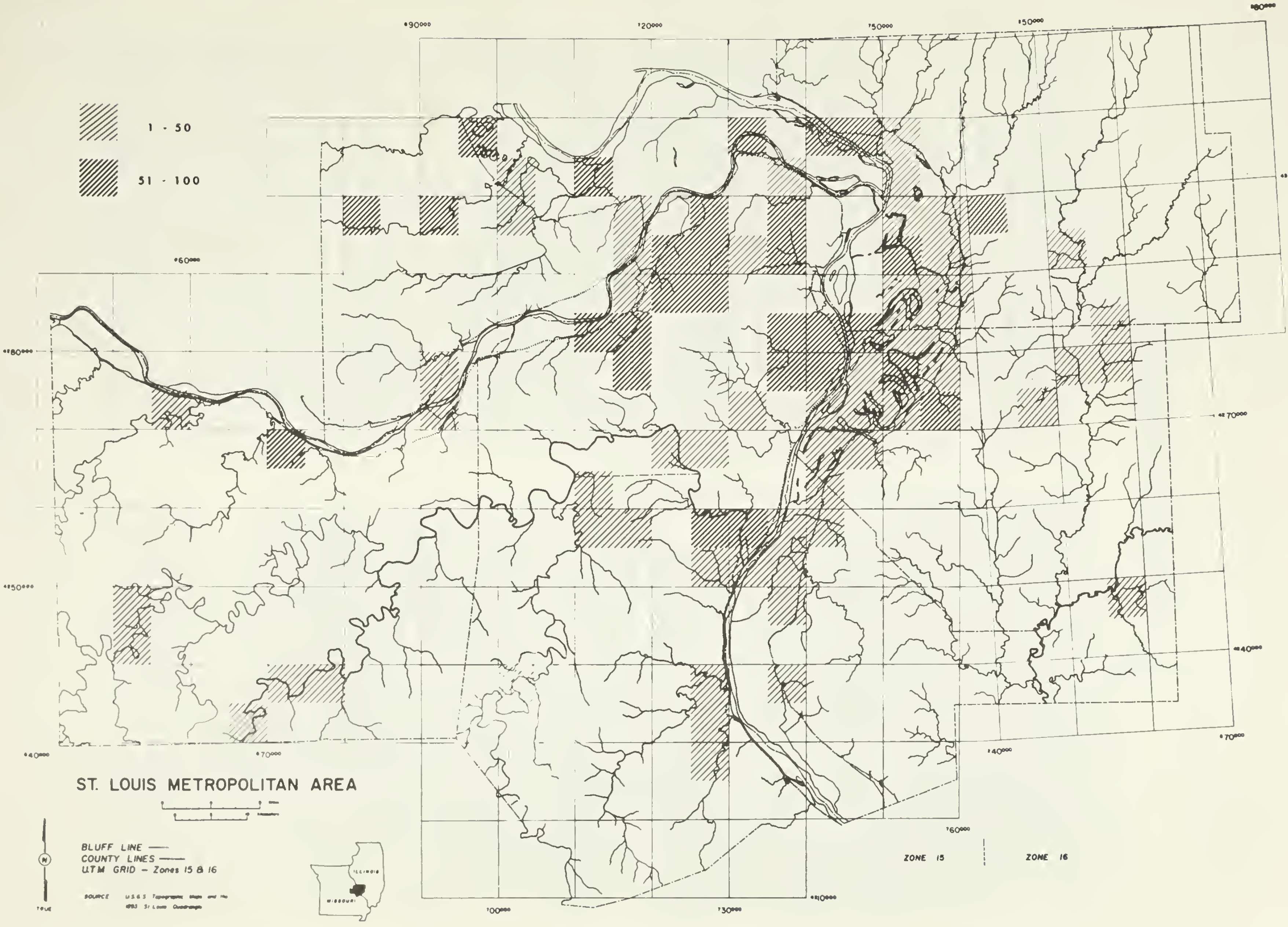

FIGURE 13. Distributions of severely disturbed archaeological sites (51-100% destroyed) by percentage of sites within each 25 km^2 unit.

ST. LOUIS AREA LAND-USE IMPACT

INTRODUCTION

As noted in the previous chapter, the archaeological resources of the greater St. Louis area are being constantly threatened and destroyed by modern land-use practices. In order to identify zones where the pressures of modern development pose the greatest threat to important archaeological resources, it is necessary to examine both present and projected distributions of land-use types in the St. Louis area. The following information on present (1971-1972) and projected (1995 and 2000) land use for the greater St. Louis area derives from several sources. The most valuable sources were three reports of the East-West Gateway Coordinating Council on present and projected land use in the greater St. Louis area (1973a, 1973b, 1973c). Another source was the Southwestern Illinois Metropolitan Area Planning Commission's 1974 study of land-use alternatives for the year 2000 (SIMAPC 1974). The final source of information was the U. S. Army Corps of Engineers, St. Louis District Plan of Study for its Water Resources Investigation (1974).

The natural resources of the St. Louis area are varied and in conjunction with a number of technological developments help support the diversified economy and urban centers of the region. Probably the most important resources are the major navigable rivers which intersect at St. Louis and provide inexpensive avenues for transportation. Also of major importance to the population in the area are the rich and productive soils of both the river valleys and the upland till plains in Illinois and Missouri. The products from these areas have served to support the urban centers with fruits, vegetables, and dairy goods, and also provide the basis for the export of cash crops. Commercially important rocks and minerals at present or in the past include coal, gravel, limestone, and oil in Illinois and limestone, sandstone, clay, sand, gravel, lead, iron, copper, and barite in Missouri.

The addition of efficient transportation networks consisting of railroads and highways to the natural waterways of the area has probably been the major factor to stimulate and support the industrial economy of the St. Louis region. Today St. Louis is a trucking and railroad center and supports industries which focus on aircraft production, steel, chemicals, food processing, and breweries.

In order to understand the distribution and focus of the various economic and population centers of the St. Louis area, it is instructive to review the history of the European settlements of the region. Since practically its first occupation in 1699 the St. Louis area has been a center of trade. The French established a mission and small agricultural settlement at the town of Cahokia in the lower American Bottoms near the beginning of the 1700s. Cahokia continued as the most important settlement in the area until 1763 when the British took over the administration of the lands east of the Mississippi River. The focus of population and trade then shifted to the newly established site of St. Louis in the Spanish territory on the bluffs on the west side of the river. With the coming of the Americans to the east side in 1778 the population in Illinois began to grow again and in 1803 the land on the west side also became American territory as part of the Louisiana purchase.

Although St. Louis continued as the major center of import-export trade and population during the early 1800s, scattered communities developed in Illinois as market and manufacturing centers for the local agricultural economy. The most important of these communities was Illinoistown or East St. Louis, located in the American Bottoms across the river from St. Louis, which served as a funnel through which goods moved in and out of St. Louis. Alton, Edwardsville, and Belleville were other local centers located along the bluffs of the American Bottoms.

Beginning in the 1850s railroad networks were extended into the area and had a major impact on the urban and industrial development of St. Louis and the communities in Illinois, particularly East St. Louis. Also important to the growth of industry in the area was the availability of coal in the Pennsylvanian deposits in Illinois. Coal mining began in the 1830s and has continued to the present day. Economic activities on both sides of the river focused on stockyards, foundries, and agricultural products. Between 1890 and 1920 the entire St. Louis area experienced widespread industrial growth and the communities on the east side of the river became centers for mining and the production of steel, petroleum, and chemicals.

PRESENT LAND USE

The area around St. Louis on the west side of the Mississippi River has become the focal point of new commercial-industrial growth and population. The rate of growth of industry and population in the east side centers has slowed since the 1930s. Heavy industry is presently located in the City of St. Louis and is also concentrated on the east side of the Mississippi, particularly near the river in Alton, Granite City, and East St. Louis. The major concentrations of light industry and commercial enterprises are in St. Louis and St. Charles counties in Missouri. Today (1970) the St. Louis area has a population of approximately 2.4 million people and statistically is the tenth largest metropolitan area in the United States. The population is concentrated in the cities of St. Louis and East St. Louis and in St. Louis and St. Charles counties. The present distribution of urban areas, major highways, recreation areas, and vacant land is presented in Figure 14.

Recent trends in the growth and distribution of population as measured between 1954 and 1971 indicate that urban expansion has proceeded along corridors which correspond with the major highways of the region and has also developed at the edges of urban locations. In St. Louis County population and development has expanded along the edges of the city and has resulted in the incorporation of many smaller outlying communities into a dense urban zone. Linear networks of urban development extend outward from the St. Louis core along major interstate highways. The most dramatic growth has been to the north and west of St. Louis in St. Charles County, as a result of both the highway network and the availability of relatively level land in the Missouri Uplands region. Other growth corridors extend to the south into Jefferson County and to the southwest along a highway paralleling the Meramec River.

The pattern of urban growth in Illinois has been more dispersed than in Missouri since the existing urban centers were originally more scattered. Urban areas have increased primarily around the Alton-Wood River area at the north end of the American Bottoms and along the corridor from East St. Louis in the American Bottoms to Belleville in the Illinois Uplands. This corridor extends along the East St. Louis rise subregion of the American Bottoms. Additional growth areas occur along the edge of the American Bottoms bluffs between Belleville and Alton centering on the communities of Collinsville and Edwardsville. In Illinois, as in Missouri, much of the development is found in linear networks which follow the major highways.

Present land use of the greater St. Louis area can be separated into vacant and developed divisions. Vacant land consists of both forested and agricultural areas. Developed land is comprised of a number of different primary land-use categories such as residential, commercial-industrial, public (military, educational), recreation, transportation, and extraction. Table 5 which is adapted from the East-West Gateway report on present land use (1973b: Table 3) tabulates the distribution of the various land-use categories within each county and for the region as a whole. Eighty-six percent of the greater St. Louis area is currently vacant land and most of this area is agricultural. The distributions of the various developed land-use types are not evenly proportioned across the area. For example, 95% of the City of St. Louis is developed land and 47% of St. Louis County is developed. The urban centers in the American Bottoms and bordering bluffs in St. Clair County make it the third most highly developed county in the area. Monroe County is the least developed county.

In every county and over the area as a whole, residential land comprises the largest percentage of developed land. Although commerical-industrial land is the second most prevalent land-use category for the area, its major concentration is in St. Louis City. The only county in which it is second in relation to

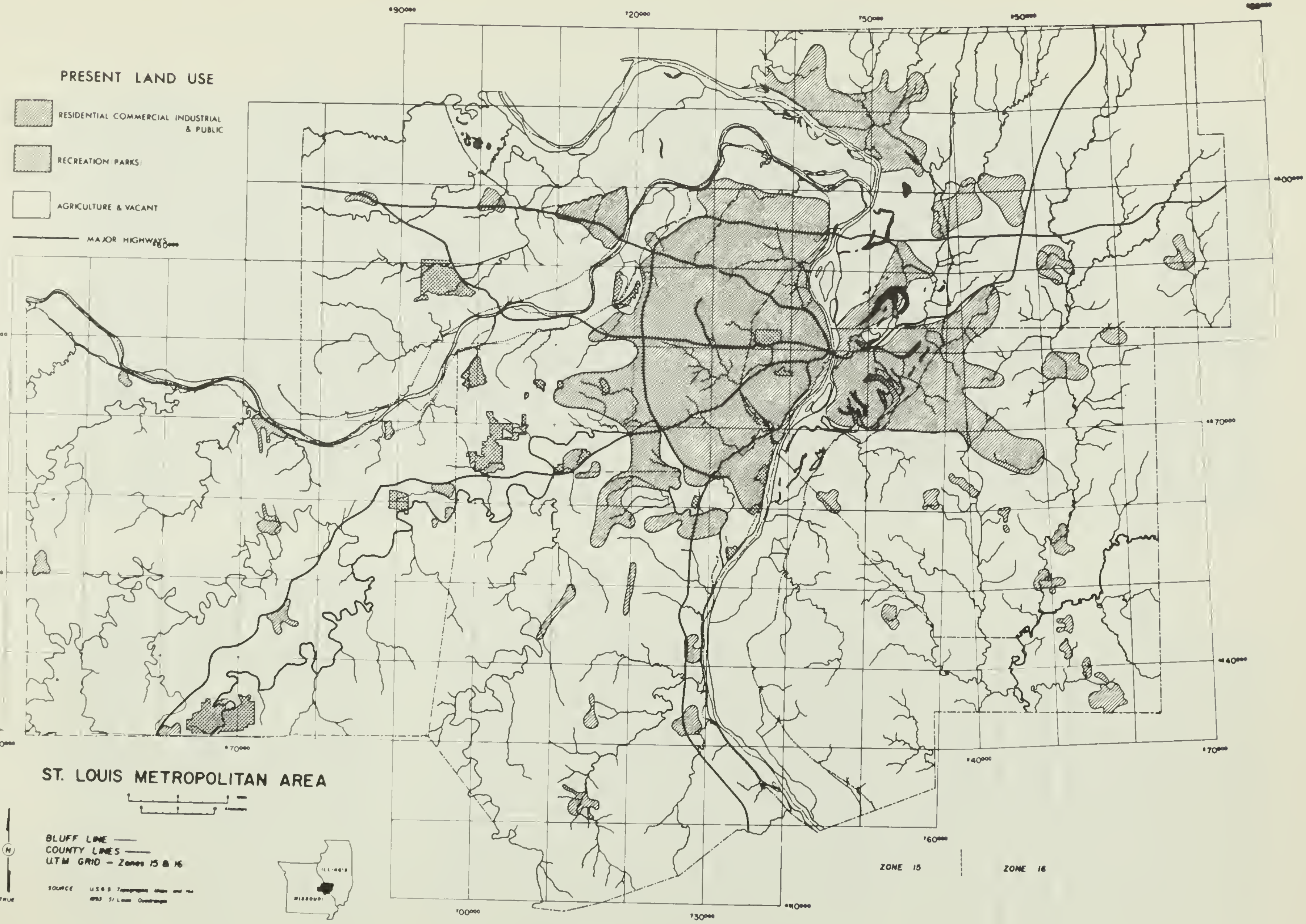

FIGURE 14. Present land use (1970-1971) in the St. Louis area (adapted from East-West Gateway 1973c: Pl. 4).

TABLE 5. Percentage Distributions of Land Use Within Counties.

	Franklin	St. Charles	St. Louis	St. Louis City	Jefferson	Madison	St. Clair	Monroe	St. Louis Region
Commercial-Industrial	0.3	0.5	5.4	25.2	0.3	2.1	1.7	0.2	1.7
Residential	2.0	4.0	29.8	50.5	6.4	8.2	7.5	2.0	8.5
Public	0.1	0.3	6.2	9.2	0.2	1.7	1.1	0.1	1.4
Recreation	1.5	2.1	3.9	7.5	0.7	0.7	1.0	0.6	1.6
Transportation	0.1	0.2	0.9	2.6	0.1	0.4	0.8	0.1	0.3
Extractive	0.1	0.1	0.5	--	0.1	0.0	2.6	0.0	0.5
Vacant	95.9	92.8	53.2	5.0	92.2	86.9	85.3	97.0	86.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

residential land use is Madison. Recreational land use consisting of local and regional parks is prevalent in St. Charles, Franklin, Jefferson, and Monroe counties. In St. Louis County public land use is the second most prevalent developed land-use category and commercial-industrial land is third. The coal mining areas in eastern St. Clair County make extractive land use important along with commerical-industrial land-use areas in the western part of the county.

The primary land use for each archaeological site location was calculated when possible during the course of the overview research and the data are summarized by county in Table 6. The table adds the category of managed water which includes canals, filled borrow pits, man-made lakes, and reservoirs and also lumps data from the City of St. Louis with St. Louis County. It should be noted that Table 5 is concerned with data for land-use areas while Table 6 involves data for point locations. Data is only presented for those sites where land use could be determined either from the site files or from topographic maps.

The overall distributions of site land-use categories are similar to those for the St. Louis area as a whole. Eighty-five percent of the sites occur on vacant land; the second most frequent land use is residential. Aside from residential land less than 6% of the known archaeological sites are located on developed land subject to intensive disturbance such as commercial-industrial, extractive, managed water, and transportation areas. Archaeological sites which remain preserved or only partially destroyed in developed land areas can be expected to be increasingly threatened as the intensity of urban development increases.

It might seem encouraging that so few of the site locations occur on developed land. A detailed examination of the kinds of land-use categories which are found in the vacant land areas, however, reveals that the potential for site destruction there is also very high. Table 7 presents a breakdown of site locations in various vacant land-use categories. The categories of vacant land include: agricultural and vacant, assigned when no more specific designation could be given; forest, assigned when either the site forms of the topographic map indicated the site was in a wooded area; pasture, assigned on the basis of information in the site files; tilled, assigned on the basis of information in the site file and including fallow land; grass, assigned on the basis of information in the site files; vacant but not wooded, assigned when a topographic map showed the area to be free of woods and no more specific data was available (sites in this category were probably located on tilled land).

Practically 40% of the archaeological sites are located on tilled land and if the category "vacant but not wooded" is assumed to be primarily tilled land, the percentage rises to almost 70%. Thus between 40% and 70% of all known archaeological sites in the St. Louis area are subject to repeated disturbance by plowing. Agricultural or vacant land use of this sort wreaks havoc with the archaeological record by obliterating the context of archaeological remains. As more intensive agricultural techniques are developed in the future, plowing will inevitably be to greater depths and additional portions of sites will be destroyed. Only 8% of the archaeological sites of the area occur in wooded locations. Although sites are not immune to disturbance in these areas, the probability of subsurface damage is much less than for areas which support crops.

PROJECTED LAND USE

The East-West Gateway Coordinating Council has prepared a land-use plan for the greater St. Louis area for the year 1995 (1973c: Pl. 10). The plan is not a prediction of where various land-use areas will develop but it is a proposed guide for regional development. Figure 15 is derived from the 1995 Land-Use Plan and displays the projected major areas of urban, transportation, recreation, and vacant land development.

Several assumptions about the future of the St. Louis area are incorporated into the land-use plan. The plan is based on a projected population for 1995 of 3.5 million people in the greater St. Louis area. It is assumed that St. Louis will maintain its competitive economic position in the national economy by improving transportation efficiency including port areas, railroads, and airports, as well as rapid transit systems. It is also assumed that the downtown St. Louis area will receive renewed interest as the regional center and that both business and cultural centers will continue to develop there. Several regional recreation areas near the urban center in Illinois and Missouri will also increase the

TABLE 6. Frequency Distributions of Site Land Use by County.

	Franklin	St. Charles	St. Louis	Jefferson	Madison	St. Clair	Monroe	St. Louis Region	
								No.	%
Commercial-Industrial	2	1	5	-	5	-	1	14	(1)
Residential	11	11	29	16	18	23	6	114	(7)
Public	2	-	-	2	12	1	-	17	(1)
Recreation	14	-	7	2	2	2	-	27	(2)
Transportation	2	3	12	11	14	15	-	57	(3)
Extractive	-	2	4	2	5	1	-	14	(1)
Managed Water	-	1	3	-	1	-	-	5	(0)
Vacant	179	47	108	228	322	288	268	1440	(85)
TOTAL	210	65	168	261	379	330	275	1688	(100)

TABLE 7. Frequency Distributions of Sites in Vacant Land-Use Categories by County.

	Franklin	St. Charles	St. Louis	Jefferson	Madison	St. Clair	Monroe	St. Louis Region	
								No.	%
Agricultural and Vacant	9	2	1	32	15	31	49	139	(8)
Forest	29	9	16	66	2	-	7	129	(8)
Pasture	4	-	-	2	-	-	-	6	(0)
Tilled	24	-	17	27	201	158	211	638	(38)
Grass	-	-	2	1	3	-	-	6	(0)
Vacant (not wooded)	113	36	72	100	101	99	1	522	(31)
TOTAL	179	47	108	228	322	288	268	1440	(85)

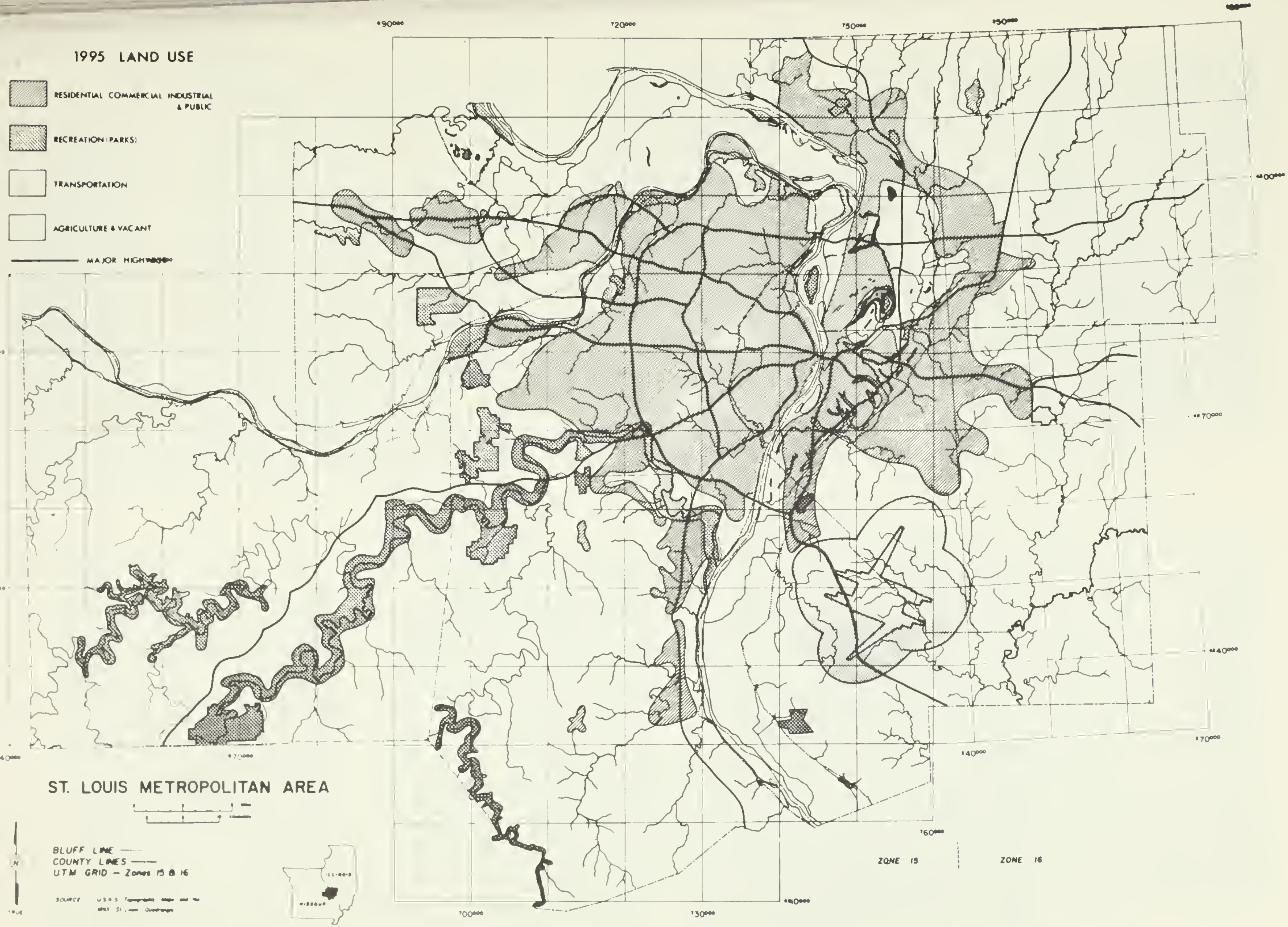

FIGURE 15. 1995 Land Use in the St. Louis area (adapted from East-West Gateway 1973c: Pl. 10).

attractiveness of the central city. Based on these assumptions, the plan stresses commerical, industrial, and residential development and intensification in areas which are already dominated by urban land use.

The land-use plan was produced by considering both physical and economic variables in determining the suitability and demand for development of particular areas. Physical constraints to development include areas of high slope, flood prone areas, soil areas with poor drainage capabilities, and water. In the St. Louis region some major barriers to land development include the Ozark Rim with highly dissected and steeply sloping land, the limestone sinkhole areas in the Illinois Uplands bordering the Mississippi River Bottom-South, the unprotected floodplain areas of the Missouri River Bottom and the Mississippi River Bottom-North, and the poorly drained areas in the northern and central portions of the American Bottoms. Some man-made physical constraints include the quarry and coal mine areas of Missouri and Illinois and the undermined coal areas in St. Clair County.

Economic variables which influence urban development include factors such as accessibility, proximity to existing urban centers, and the availability of service facilities. In the St. Louis area economic constraints to development include the large areas of vacant or undeveloped land which are not served by efficient transportation and water and sewer facilities. Areas which can efficiently support new urban development are found near existing centers of population where major highways exist or are proposed and where sewer and water facilities can be established.

Within the limitations of the previously described physical constraints, the 1995 land-use plan suggests that urban development should intensify in the immediate vicinity of St. Louis and spread out from the urban center to the west, south, and east along present or proposed major highways. The primary concentrations of projected urban areas occur in the Missouri Uplands particularly south of the Missouri River, the American Bottoms especially at its northern end and along the East St. Louis Rise, and the Illinois Uplands along the area bordering on the American Bottoms.

The projected expansion and intensification of urban areas around St. Louis poses a major threat to some of the most important archaeological resources of the region. On the east side of the Mississippi River particularly, urban development threatens most of the archaeologically rich areas of the American Bottoms and practically all of the bordering uplands. It is of critical importance that many of the archaeological sites in these areas be preserved for they are unique in the prehistory of the United States.

The land-use plan exempts a small portion of the American Bottoms and bordering uplands from intensive development due to the area's poor drainage characteristics. There are a number of important archaeological sites in this section and this could be a prime area for establishing an archaeological preserve where the resources would be protected against development.

The westward expansion of the St. Louis urban area also threatens many important known or projected archaeological resources such as burial areas and Woodland settlements particularly along the bluffs at the junction of the Mississippi and Missouri rivers. Another location where expanding urbanism will have an impact on important archaeological resources occurs along the western edge of the Mississippi River south of St. Louis at the mouths of Plattin and Joachim creeks where both Mississippian sites and rockshelter areas occur.

In addition to the growth of the central urban areas there are several special features proposed in the St. Louis region which will have a substantial impact on the archaeological resources. A major airport facility is currently proposed for northern Monroe County. Because of its size and importance for the maintenance of the St. Louis urban community, there will be considerable accompanying commercial and residential development in the area and along the routes leading to the facility. The area of the proposed airport is archaeologically unknown and has never been surveyed, but important archaeological resources have been projected to occur especially along the larger streams in the area. In addition, important resources lie along the highway route which leads to the airport.

Several extensive recreation areas are currently in the planning stages. Three of these areas involve the damming of waterways and the formation of reservoirs. Two of the proposed reservoirs occur in areas of known archaeological significance. One, the Union Reservoir along the Bourbeuse River, occurs in an area rich in rockshelters and caves. The other, the Pine Ford Reservoir along the Big River in Jefferson County, occurs in the area which supports the westernmost concentration of Mississippian sites. The proposed reservoirs and associated recreation development will damage or destroy many irreplaceable and important archaeological sites which promise to contain valuable information about Midwestern prehistory. The development of additional recreation areas especially along the Meramec River and around Horseshoe Lake in the American Bottoms also threatens extremely important known or projected archaeological sites. The location of archaeological sites in each of these areas must be determined so that facilities and public-use areas can be carefully planned to allow for the conservation of the archaeological resources.

An area of potential development which is not reflected in the land-use plan but which will have a substantial impact on important archaeological resources occurs along the Kaskaskia River. The U. S. Army Corps of Engineers is completing a canalization project which will not only control the course of the river but also make it navigable. The development of the river in conjunction with the expected increasing demand for the coal in southeastern St. Clair County marks this area as a probable locus for commerical, industrial, and residential development. The concentration of Mississippian and related Late Woodland archaeological sites along the Kaskaskia and its tributaries make this an important area and measures should be taken to insure the conservation of these archaeological resources.

Figure 16 presents zones of potential impact of future land-use projects on important archaeological resources. The areas pinpointed are expected to witness increasing pressures for urban and recreational development. The areas also contained known or projected archaeological resources which are of particular importance for gaining an understanding of the processes and timing of prehistoric cultural developments in the St. Louis area. Many of these resources are unique to the area and management programs must be developed to insure their preservation so they will be available for study and enjoyment by future generations of Americans.

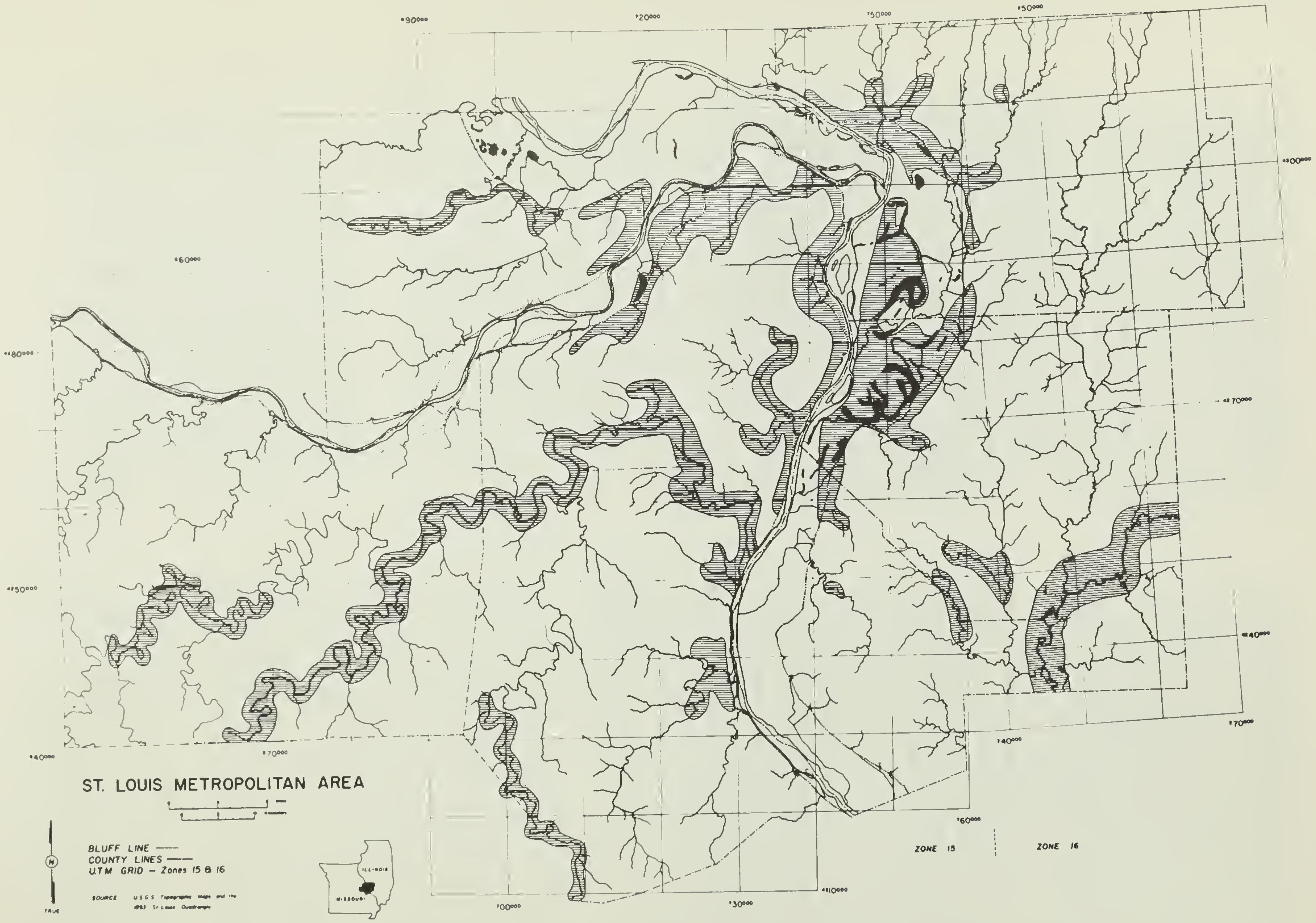

FIGURE 16. Areas of known and projected important archaeological resources which are or will be subject to adverse impacts from urban and recreational development in the St. Louis area.

RECOMMENDATIONS AND SUMMARY

RECOMMENDATIONS

The unique and important archaeological resources of the greater St. Louis area are being continuously and, in some areas, intensely threatened by the growing metropolis and its network of transportation routes, surrounding communities, agricultural zones, and recreational areas. Archaeologists and land-use planners need to make every effort to see that the existing, and particularly the threatened, resources are managed wisely. The preservation of archaeological sites should be the major goal of any management plan but, in instances where sites must be destroyed, the conservation of materials and information should be accomplished.

It is not within the scope of this project to propose or develop an archaeological resource management plan for the St. Louis area. On the basis of the picture obtained from this overview, however, it is possible to make recommendations regarding particular elements which should be a part of a management program and avenues which should be explored in planning for the conservation of the archaeological resource base.

There is a considerable amount of existing federal legislation which provides for the conservation of cultural, historic, and archaeological resources on federally owned or federally influenced land. The particularly relevant laws include the following: *The Historic Sites Act of 1935, The Department of Transporation Act of 1966, The National Historic Preservation Act of 1966, The National Environmental Policy Act of 1969, Executive Order 11593 of 1971,* and *The Archaeological and Historic Preservation Act of 1974.* The combined application of these legislative tools is creating a large scale national program of commitment and action on historic sites preservation. The federal laws provide for the inventory, assessment, registration, and conservation of archaeological sites of local, regional, state, or national significance. The laws apply to federally owned property and to projects which are funded or licensed by federal agencies. Archaeologists in both the states of Illinois and Missouri are becoming increasingly active in seeing that the laws are applied with vigor to threatened archaeological resources.

Only a small proportion of the archaeological resources in the St. Louis area are on lands owned or administered by the federal government, however. Table 8 presents data on the ownership of known archaeological sites by county. Of those sites for which there was ownership information in the files, only 23 or 2% of the total occur on federally owned property while 1144 archaeological sites or 90% of the total are privately owned. Development on the private land will continue to destroy archaeological sites unless property owners are made aware of the importance of conserving the archaeological resources which make up a part of their nation's heritage. The cause of historic sites preservation will be greatly enhanced by the development of programs for educating the public about the wealth and variety of archaeological resources in the region.

Although most land on which archaeological sites are located is privately owned, there are a number of federally assisted or sponsored projects planned for the St. Louis area which will affect both private and commercial as well as federal land. Examples of these projects include water resources, transportation routes, and transportation facilities.

The construction of reservoirs, canals, port facilities, levees, locks, and dams will involve the U. S. Army Corps of Engineers. It is critical that assessment of the impact of these projects on archaeological resources include not only the direct effects of water management on the resources but also the indirect effects. Although flooding and dumping will obviously destroy many sites along stream and river valleys, the development of recreation facilities along lakes and industry along canals, for example, will also threaten a large part of the resource base. Since most of the known archaeological resources of the area occur in proximity to stream and river valleys, it is especially important that the

TABLE 8. Frequency Distributions of Site Location Ownership* by County.

	Franklin	St. Charles	St. Louis	Jefferson	Madison	St. Clair	Monroe	St. Louis Region	
								No.	%
Commercial-Industrial	-	1	7	5	7	2	-	22	(2)
Public	-	-	8	-	4	-	-	12	(1)
City or Town	-	-	1	2	4	1	-	8	(1)
County	-	-	5	-	-	-	-	5	(0)
State	15	1	2	4	30	-	1	53	(4)
Federal	-	-	10	8	5	-	-	23	(2)
Private	164	54	80	204	282	133	227	1144	(90)
TOTAL	179	56	113	223	332	136	228	1267	(100)

*Ownership data is derived from site files. Public is a general category including educational institutions, cemeteries, parks, etc. used when more precise identification of ownership by federal, state, county, or city-town could not be determined. Commercial-Industrial refers to ownership by firms. Private refers to ownership by individuals or estates.

Corps of Engineers consider the indirect as well as the direct effects of their projects in all planning stages.

Projects sponsored, funded, or licensed by the Department of Transportation will also continue to have a substantial impact on the archaeological resources of the St. Louis area. Major highways are currently planned which will cross the archaeologically rich American Bottoms and cut across the bluff areas bordering the major river valleys in Illinois and Missouri. Although the direct destructive effects of highway construction on archaeological sites will have to be evaluated in planning and mitigated in practice, the indirect effects such as the spread of commercial and residential areas along these improved corridors must also be considered in planning the routes.

Federal monies and licensing will also undoubtedly be involved in a variety of other projects in the St. Louis area such as railroad improvements, airport construction, urban renewal, and economic development. Since many important archaeological resources are known and projected to exist in the present and developing urban areas, it is imperative that the federal agencies involved in urban development projects be made aware of the archaeological potential of the area and of their responsibilities under the law.

One tool for identifying and protecting important archaeological resources is the National Register of Historic Places. Archaeological and historic sites and districts on the Register are protected through procedural requirements from uncontrolled destruction by federal or federally assisted projects. Before a project which threatens a site on or eligible for the National Register of Historic Places may proceed, comment is required from the Advisory Council on Historic Preservation. The Advisory Council comment is made only after a review and evaluation of any adverse effects of the project on the historic resource and the comment recommends appropriate action.

Several archaeological sites in the St. Louis area are on, or have been nominated to, the National Register as historic sites or historic districts. Some of the more outstanding sites and districts include the Cahokia Site in the American Bottoms: the Pulcher Site, a large Mississippian settlement at the south end of the American Bottoms; Emerald Mound, the principal mound at a large Mississippian settlement in the Illinois Uplands; and the Crescent Quarry District in the Ozark Rim. The number of sites and districts on the Register from the St. Louis area, however, only scratches the surface of the area's important and irreplaceable archaeological resources.

Because of the time and costs involved in nominating individual sites to the National Register, it is recommended that large areas of archaeological importance be nominated as districts. The most important potential historic district of the area is the American Bottoms and its bordering uplands for here lie the important Cahokia site with its support communities as well as many other sites which can provide information regarding the development of the Cahokian system. The small portion of the bottoms and bordering upland which is excluded from development in the 1995 land-use plan (see Fig. 15) should be designated as an area to be set aside as an archaeological preserve within the historic district.

There are several other potential historic districts in the St. Louis area. Those which are essential for understanding the development and maintenance of the unique Mississippian cultural system in the St. Louis region include the Kaskaskia River drainage, the Silver Creek drainage, the Big River drainage, and the Mississippi River Bottom-South. Other possible districts which encompass important archaeological resources include the three areas along the Bourbeuse River, Meramec River, and Joachim Creek where concentrations of rockshelters and caves occur.

This overview of the archaeological resources of the St. Louis area has demonstrated that there is a great deal yet to be learned about the distribution and nature of archaeological sites in the region. If management programs are to be effective, more complete and detailed information on the extent and condition of the resource base must be collected. A coordinated and long-term program of archaeological survey and testing throughout the region is recommended.

An archaeological survey program in the St. Louis area should consist of several approaches. While this overview study has been concerned only with archaeological sites reported in the state files, there are at least two other resources which can provide information on known site location, significance, and condition—local amateur archaeologists and professional archaeologists. A program of amateur and professional informant interviewing will produce information on many known archaeological sites which have never been reported.

In addition to informant interviewing, the need for a large scale pedestrian survey is critical for assessing the true archaeological potential of the region. The survey should consider areas of known archaeological significance, areas of projected significance, and areas which are projected to have little archaeological significance. Since the areas of little archaeological significance are essentially physical settings such as uplands and prairies which have never been surveyed, they should receive particular attention. Probably the most productive approach for the survey will be to systematically sample various settings in each physical region in order to obtain detailed information on resource distributions and significance.

Two procedures should be added to the traditional methodology for conducting pedestrian surveys. First, rapid subsurface testing techniques should be used in areas where the surface is obscured so that these settings will not be excluded from future studies. Second, records must be kept and evaluations made of areas or settings which are surveyed but which do not reveal archaeological resources.

In order to establish and maintain an archaeological resources management program, there must be coordination between archaeologists and agencies whose programs can affect archaeological sites. The St. Louis area fortunately has two regional planning commissions which evaluate and channel specific development proposals from a variety of agencies as well as assess general directions of urban development and land use. The East-West Gateway Coordinating Council located in St. Louis is concerned with development in the entire seven-county area encompassed by this overview study. The Southwestern Illinois Metropolitan Area Planning Commission located in Collinsville, Illinois directs its attention to development in the Illinois counties of the study area. The coordination of archaeological programs with these planning agencies will enable the archaeologist to stay abreast of proposed regional development programs and trends and to involve the regional planners and local agencies in programs for the preservation of archaeological resources.

The future of archaeological resources in the St. Louis area lies basically in the hands of the professional archaeological community. Only the professional archaeologist can provide the expertise necessary to collect and evaluate the data and the knowledge for deciding what archaeological resources will be preserved for the benefit of future generations. It is only through continuous efforts of updating information, assessing significance, evaluating programs, and educating the public that efficient and effective planning and management can be accomplished. If archaeologists fail to become involved in these processes, then there is little chance that significant archaeological resources will be preserved.

SUMMARY

The overview of the archaeological resources of the St. Louis area has provided a beginning for a coordinated program of cultural resource management in the region. The overview study examined the quality, distribution, and condition of the known archaeological resource base and suggested the possible extent of important archaeological resources in the area. In addition, the overview study investigated the present and projected impact of modern land use on the archaeological resource base and identified zones where important resources are most threatened. Finally, measures were proposed for promoting the preservation of the known archaeological resources, conducting a more detailed assessment of the cultural resource base, and establishing an effective management program.

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APPENDIX 1

ST. LOUIS AREA ARCHAEOLOGICAL RESOURCES PROJECT

CODE BOOK SUMMARY

Card 1

Column		
1-2	Format Indicator	
	04 - St. Louis Area Archaeological Resources Project	
3-4	State	
	13 - Illinois	
	25 - Missouri	
5-7	County	
	Illinois	Missouri
	060 - Madison	036 - Franklin
	067 - Monroe	050 - Jefferson
	082 - St. Clair	092 - St. Charles
		096 - St. Louis
8-10	Project Site	
11-13	State Survey Site Number	
14-16	Illinois State Museum - first assigned number	
17-19	Illinois State Museum - last number in inclusive series	
	Site Location Information	
20-21	Quadrangle sheet (USGS)	
22	UTM Zone	
	0 - unknown	
	1 - Zone 15	
	2 - Zone 16	
23-29	Meters North	
30-35	Meters East	
36-38	Average Elevation - in feet (calculated for Missouri only)	
	Site Size Information - dimensions and area	
39-55	Omitted	

APPENDIX 1 - CONT.

56 Regional Land Form

0 - unknown
1 - Illinois Upland
2 - Missouri Upland
3 - Ozark Rim
4 - Ozark Upland
5 - Miss. River Bottom - North
6 - Miss. River Bottom - American Bottom
7 - Miss. River Bottom - South
8 - Mo. River Bottom

57-58 Topography

00 - unknown
01 - bottom
05 - high terrace
09 - talus slope
10 - bluff face (Mo. or Miss. River)
11 - bluff summit - w/in 100 meters (Mo. of Miss. River)
12 - hill or upland slope to interior bottom
13 - hill or upland summit next to interior bottom
14 - bordering upland - w/in 1 kilometer of Mo. or Miss. River bluff summit)
15 - interior upland
16 - bluff face next to interior bottom
17 - bluff summit next to interior bottom

59 Subject to flooding

0 - no
1 - yes

Hydrographic Information

60 Drainage System Affiliation

0 - unknown
1 - Mississippi
2 - Missouri
3 - Meramec
4 - Kaskaskia

61-62 Watershed

63 Nearest water resource

0 - unknown
1 - river
2 - stream
3 - intermittent stream
4 - lake
5 - slough
6 - spring
7 - sinkhole
8 - swamp
9 - none

APPENDIX 1 - CONT.

64 Order of Stream

65-71 Distance to permanent water - horizontal and vertical omitted

72-76 Soils Information - omitted

Vegetation (U. S. Land Survey Plats)

77 Site location

- 0 - unknown
- 1 - wet bottomland prairie
- 2 - wet bottomland woodland
- 3 - upland prairie
- 4 - upland or slope woodland
- 5 - wet bottomland/woodland edge
- 6 - upland prairie/woodland edge
- 7 - wet bottomland prairie/upland woodland edge

78 Site vicinity (w/in 3 kilometers)

- 0 - unknown
- 1 - prairie
- 2 - mostly prairie
- 3 - woodland
- 4 - mostly woodland
- 5 - prairie and woodland - equal amounts

79 Card number

1

Card 2

Column

1-16 Same as Card 1

Cultural/temporal affiliation of site
Universal Code

- 0 - not applicable
- 1 - applicable
- 2 - probably applicable

17 Affiliation unknown

18 Paleo-Indian

19 Paleo-Indian or Archaic (Plano and Dalton)

20 Archaic

21 Early Archaic

22 Middle Archaic

23 Late Archaic

APPENDIX 1 - CONT.

24 Archaic or Woodland

25 Woodland

26 Early Woodland

27 Middle Woodland

28 Late Woodland

29 Late Woodland or Mississippian (red slip, limestone temper)

30 Mississippian

31 Early Mississippian

32 Late Mississippian

33 Oneota

34 Historic Indian

35 Cultural affiliation identification by
- 1 - survey files or publication
- 2 - Benchley
- 3 - files and Benchley in agreement

36-38 Type of remains
- 0 - unknown
- 1 - scattered debris
- 2 - concentrated debris
- 3 - mound(s)
- 4 - cairn
- 5 - stone slab graves
- 6 - graves
- 7 - earthwork
- 8 - stonework
- 9 - trail
- 90 - petroglyphs
- 10-92 - various combinations of the above

39 Remains identified from
- 0 - unknown
- 1 - surface observations
- 2 - excavation
- 3 - surface observation and excavation

40 Mound type

41 Mound number (range in increments of 5)

APPENDIX 1 - CONT.

Nature of debris

42 Lithics

- 0 - absent
- 1 - unknown
- 2 - present
- 3 - chipped
- 4 - ground
- 5 - chipped and ground

43-44 Ceramics

- 0 - absent
- 1 - unknown
- 2 - present
- 3 - grit
- 4 - grog
- 5 - grit-grog
- 6 - limestone
- 7 - shell
- 8 - "hole"
- 10-26 - various combinations of the above

45-46 Site Function (from survey records)

- 00 - unknown
- 01 - workshop
- 02 - quarry
- 03 - field
- 04 - hunting station
- 05 - rockshelter or cave
- 06 - camp
- 07 - farmstead
- 08 - village
- 09 - town
- 10 - burial area
- 11 - ceremonial center
- 12 - route
- 13 - cache
- 14 - battlefield
- 15 - large town (Cahokia Site)
- 99 - other

47 Survey Report (or publication) by

- 0 - unknown
- 1 - professional
- 2 - amateur
- 3 - archival

APPENDIX 1 - CONT.

48 Type of Reconnaissance

- 0 - unknown
- 1 - chance discovery
- 2 - scattered grab survey (Griffin, Mills, etc)
- 3 - extensive grab survey (most professional surveys)
- 4 - intensive grab survey (Porter, Cottier, etc.)
- 5 - systematic survey (none)

49-50 Primary Land Use at Site - latest report

- 00 - unknown
- 01 - agricultural and vacant
  - 02 - woods
  - 03 - pasture
  - 04 - crops (or fallow)
- 05 - residential
- 06 - commercial-industrial
  - 07 - commercial
  - 08 - industrial
- 09 - extractive
- 10 - transportation
- 11 - public (military, educational, cemetery)
- 12 - recreation
- 13 - managed water (canal, reservoir, borrow pit)
- 14 - grassland (not in use)
- 15 - vacant but not wooded - use unknown

51 Amount of site destroyed at latest report

- 0 - unknown
- 1 - not disturbed
- 2 - 1-25% - slight damage (plowed)
- 3 - 26-50% - moderate damage (plowed & eroded, etc.)
- 4 - 51-75% - extensive damage
- 5 - 76-100% - extreme damage

52 Site owner at latest report

- 0 - unknown
- 1 - public
  - 2 - city or town
  - 3 - county
  - 4 - state
  - 5 - federal
- 6 - commercial-industrial
- 7 - private

53 Date of latest report

- 0 - unknown
- 1 - pre-1900
- 2 - 1900-1919
- 3 - 1920-1929

etc.

APPENDIX 1 - CONT.

54-55 Present land use - taken from USGS maps if more recent than latest report on site, otherwise same as latest report - unless more recent data is known.

56 Present amount of site destroyed (see above)

57 Present site owner (see above)

58-70 Not used

71-72 Latest update on USGS map used

73-77 Not used

78 Site location reliability

- 1 - Excellent - good description, reliable surveyor, or good map
- 2 - Good - good description, surveyor unknown or variable, or moderate map
- 3 - Moderate - limited description, exact location unsure, physiographic location close
- 4 - Poor - limited description, in general area, physiography known (bottom or upland)
- 5 - Bad - in general area, physiography unknown
- 9 - not locatable

79 Card number

- 2

80 Extra data

- 0 - does not exist
- 1 - exists

APPENDIX 2

SITE DISTRIBUTIONS

PERIOD BY PHYSICAL REGION BY TOPOGRAPHY

Paleo-Indian	Bott	Hi Terr	Tal Slo	Bl Face	Bl Sum	Int Hl Slo	Int Hl Sum	Bord Upl	Int Upl	Int Bl Face	Int Sum	Total
Ill					1		2					3
Upl					33		67					100
Mo						2	1					3
Upl						67	33					100
Oz						2						2
Rim						100						100
Oz						2		1				3
Upl						67		33				100
Miss												–
No												–
Amer												–
Bott												–
Miss												–
So												–
Mo												–
Bott												–
Total					1	6	3	1				11
					9	55	27	9				100

APPENDIX 2 - CONT.

Archaic	Bott	Hi Terr	Tal Slo	Bl Face	Bl Sum	Int Hl Slo	Int Hl Sum	Bord Upl	Int Upl	Int Bl Fac	Int Bl Sum	Total
Ill	10				10	9	163	7				199
Upl	5				5	4	82	4				100
Mo	8				13	8	9	1	3			42
Upl	19				31	19	21	2	7			99
Oz	22	1			1	17	10	1	4	9	1	66
Rim	33	2			2	26	15	7	6	14	2	102
Oz	19					14	2	1		2	3	41
Upl	46					34	5	2		5	7	99
Miss	1		1									2
No	50		50									100
Amer	33	5	1									39
Bott	85	13	2									100
Miss	2											2
So	100											100
Mo	1	1										2
Bott	50	50										100
Total	96	7	2		24	48	184	10	7	11	4	393
	24	2	0		6	12	47	2	2	3	1	99
Early Woodland												
Ill	1											1
Upl	100											100
Mo												–
Upl												–
Oz										1		1
Rim										100		100

APPENDIX 2 - CONT.

Early Woodland	Bott	Hi Terr	Tal Slo	Bl Face	Bl Sum	Int Hl Slo	Int Hl Sum	Bord Upl	Int Upl	Int Bl Face	Int Bl Sum	Total
Oz										1		1
Upl										100		100
Miss												–
No												–
Amer	5	1	1									7
Bott	71	14	14									99
Miss	12											12
So	100											100
Mo												–
Bott												–
Total	18	1	1							2		22
	82	4	4							9		99
Middle Woodland												
Ill	4			1	1		1	1			2	10
Upl	40			10	10		10	10			20	100
Mo	2				4		1	1				8
Upl	25				50		12	12				99
Oz	3				2	1						6
Rim	50				33	17						100
Oz	2											2
Upl	100											100
Miss												–
No												–
Amer	19	2	1									22
Bott	86	9	4									99

APPENDIX 2 - CONT.

Middle Woodland	Bott	Hi Terr	Tal Slo	Bl Face	Bl Sum	Int Hl Slo	Int Hl Sum	Bord Upl	Int Upl	Int Bl Face	Int Bl Sum	Total
Miss	15		1									16
So	94		6									100
Mo	1											1
Bott	100											100
Total	45	2	1	1	7	1	2	2			2	63
	71	3	2	2	11	2	3	3			3	100
Late Woodland												
Ill	27	1		4	19	6	95	3	1		5	161
Upl	17	1		2	12	4	59	2	1		3	101
Mo	8	1			6	6	8		2			31
Upl	26	3			19	19	26		6			99
Oz	4	1		2	2	3	2			1		15
Rim	27	7		13	13	20	13			7		100
Oz	19					2		1		12		34
Upl	56					6		3		35		100
Miss	2											2
No	100											100
Amer	52	2	3									57
Bott	91	4	5									100
Miss	71	4	2									77
So	92	5	2									99
Mo	2	1										3
Bott	67	33										100
Total	185	10	5	6	27	17	105	4	3	13	5	380
	49	3	1	2	7	4	28	1	1	3	1	100

APPENDIX 2 - CONT.

Transitional	Bott	Hi Terr	Tal Slo	Bl Face	Bl Sum	Int Hl Slo	Int Hl Sum	Bord Upl	Int Upl	Int Bl Face	Int Bl Sum	Total
Ill	3											3
Upl	100											100
Mo								1				1
Upl								100				100
Oz		1										1
Rim		100										100
Oz	1				1	1						3
Upl	33				33	33						99
Miss												–
No												–
Amer	6		1									7
Bott	86		14									100
Miss	31	1										32
So	97	3										100
Mo												–
Bott												–
Total	41	2	1		1	1		1				47
	87	6	2		2	2		2				101
Mississippian												
Ill	10			1	12		24	2	1			50
Upl	20			2	24		48	4	2			100
Mo	10	1			6	2	1		1			21
Upl	48	5			28	10	5		5			101
Oz	12	1		3	2	3		1		1		23
Rim	52	4		13	9	13		4		4		99

APPENDIX 2 - CONT.

Mississippian	Bott	Hi Terr	Tal Slo	Bl Face	Bl Sum	Int Hl Slo	Int Hl Sum	Bord Upl	Int Upl	Int Bl Face	Int Bl Sum	Total
Oz	29					3				4		36
Upl	80					8				11		99
Miss												–
No												–
Amer	52	2	4									58
Bott	90	3	7									100
Miss	38	4										42
So	90	9										99
Mo	1											1
Bott	100											100
Total	152	8	4	4	20	8	25	3	2	5		231
	66	3	2	2	9	3	11	1	1	2		100

APPENDIX 3

SITE DISTRIBUTIONS

PERIOD BY PHYSICAL REGION BY WATER SOURCE

Paleo-Indian	River	Stream	Int Str	Lake	Slough	Spring	Sinkhole	Swamp	Total
Ill		2					1		3
Upl		67					33		100
Mo		2	1						3
Upl		67	33						100
Oz		1	1						2
Rim		50	50						100
Oz		3							3
Upl		100							100
Total		8	2				1		11
		73	18				9		100
Archaic									
Ill		100	92	4			2	1	199
Upl		50	46	2			1	1	100
Mo	3	17	21						41
Upl	7	41	51						99
Oz		35	30						65
Rim		54	46						100
Oz		26	13				1		40
Upl		65	32				3		100
Miss		1	1						2
No		50	50						100

APPENDIX 3 - CONT.

Archaic	River	Stream	Int Str	Lake	Slough	Spring	Sinkhole	Swamp	Total
Amer		12	10	15				2	39
Bott		31	26	38				5	100
Miss		1	1						2
So		50	50						100
Mo		1	1						2
Bott		50	50						100
Total	3	193	169	19		3	3		390
	1	49	43	5		1	1		100

Early Woodland									
Ill			1						1
Upl			100						100
Mo									–
Upl									–
Oz			1						1
Rim			100						100
Oz		1							1
Upl		100							100
Miss									–
No									–
Amer		4		1				1	6
Bott		66		17				17	100
Miss		6	5					1	12
So		50	42					8	100
Mo									–
Bott									–
Total		11	7	1				2	21
		52	33	5				10	100

APPENDIX 3 - CONT.

Middle Woodland	River	Stream	Int Str	Lake	Slough	Spring	Sinkhole	Swamp	Total
Ill		5	2	3					10
Upl		50	20	30					100
Mo	1	2	5						8
Upl	12	25	62						99
Oz		3	3						6
Rim		50	50						100
Oz		2							2
Upl		100							100
Miss									–
No									–
Amer		11	2	7				2	22
Bott		50	9	32				9	100
Miss		7	5	2				2	16
So		44	31	12				12	99
Mo								1	1
Bott								100	100
Total	1	30	17	12				5	65
	2	46	26	18				8	100
Late Woodland									
Ill		106	35	15	1		1	3	161
Upl		66	22	9	1		1	2	101
Mo	1	13	17						31
Upl	3	42	55						100
Oz	2	8	5						15
Rim	13	53	33						99

APPENDIX 3 - CONT.

Late Woodland	River	Stream	Int Str	Lake	Slough	Spring	Sinkhole	Swamp	Total
Oz		25	9						34
Upl		74	26						100
Miss		1	1						2
No		50	50						100
Amer		16	8	26	1			6	57
Bott		28	14	46	2			10	100
Miss		25	27	13				12	77
So		32	35	17				16	100
Mo		2						1	3
Bott		67						33	100
Total	3	196	102	54	2		1	22	380
	1	52	27	14	0		0	6	100

Transitional									
Ill		1	1	1					3
Upl		33	33	33					99
Mo			1						1
Upl			100						100
Oz			1						1
Rim			100						100
Oz		2	1						3
Upl		67	33						100
Amer		2		4				1	7
Bott		28		57				14	99
Miss		6	15	7				4	32
So		18	47	22				12	99
Total		11	19	12				5	47
		23	40	26				11	100

APPENDIX 3 - CONT.

Mississippian	River	Stream	Int Str	Lake	Slough	Spring	Sinkhole	Swamp	Total
Ill		25	17	8					50
Upl		50	34	16					100
Mo	3	4	11	3					21
Upl	14	19	52	14					99
Oz	5	12	6						23
Rim	22	52	26						100
Oz		27	9						36
Upl		75	25						100
Miss									–
No									–
Amer		15	7	29				7	58
Bott		26	12	50				12	100
Miss		13	17	7		1		4	42
So		31	40	17		2		10	100
Mo		1							1
Bott		100							100
Total	8	97	67	47		1		11	231
	3	42	29	20		0		5	99

APPENDIX 4

SITE DISTRIBUTIONS

PERIOD BY PHYSICAL REGION BY AREA VEGETATION

Paleo-Indian	Prair	MorPra	Wood	MorWood	P=W	Total
Ill				2	1	3
Upl				67	33	100
Mo			3			3
Upl			100			100
Oz			2			2
Rim			100			100
Oz			3			3
Upl			100			100
Total			8	2	1	11
			72	18	9	99

Archaic						
Ill		36	9	132	22	199
Upl		18	4	66	11	99
Mo			36	3	3	42
Upl			86	7	7	100
Oz			65	1		66
Rim			98	2		100
Oz			41			41
Upl			100			100
Miss		2				2
No		100				100
Amer		11	1	19	8	39
Bott		28	2	49	20	99
Miss				1	1	2
So				50	50	100
Mo			2			2
Bott			100			100
Total	–	49	154	156	34	393
		12	39	40	9	100

APPENDIX 4 - CONT.

Early Woodland	Prair	MorPra	Wood	MorWood	P=W	Total
Ill				1		1
Upl				100		100
Mo						–
Upl						–
Oz			1			1
Rim			100			100
Oz			1			1
Upl			100			100
Miss						–
No						–
Amer		1		5	1	7
Bott		14		71	14	99
Miss		3		8	1	12
So		25		67	8	100
Mo						–
Bott						–
Total		5	18	29	13	65
		8	28	45	20	101

Middle Woodland						
Ill			1	8	1	10
Upl			10	80	10	100
Mo			5	1	2	8
Upl			62	12	25	99
Oz			6			6
Rim			100			100
Oz			2			2
Upl			100			100
Miss						–
No						–
Amer		3	1	13	5	22
Bott		14	4	59	23	100

APPENDIX 4 - CONT.

Middle Woodland	Prair	MorPra	Wood	MorWood	P=W	Total
Miss		2	2	7	5	16
So		12	12	44	31	99
Mo			1			1
Bott			100			100
Total		5	18	29	13	65
		8	28	45	20	101
Late Woodland						
Ill		10	11	125	15	161
Upl		6	7	78	9	100
Mo		1	26	1	3	31
Upl		3	84	3	10	100
Oz			14	1		15
Rim			93	7		100
Oz			33	1		34
Upl			97	3		100
Miss						–
No						–
Amer		8	1	41	7	57
Bott		14	2	72	12	100
Miss		10	6	44	17	77
So		13	8	57	22	100
Mo			3			3
Bott			100			100
Total		29	94	213	42	378
		8	25	56	11	100
Transitional						
Ill			1	2		3
Upl			33	67		100
Mo			1			1
Upl			100			100
Oz			1			1
Rim			100			100

APPENDIX 4 - CONT.

Transitional	Prair	MorPra	Wood	MorWood	P=W	Total
Oz			3			3
Upl			100			100
Miss						–
No						–
Amer		4		3		7
Bott		57		43		100
Miss		11	3	15	3	32
So		34	9	47	9	99
Mo						–
Bott						–
Total		15	9	20	3	47
		32	19	42	6	99

Mississippian						
Ill		1	4	40	5	50
Upl		2	8	80	10	100
Mo			20	1		21
Upl			95	5		100
Oz			23			23
Rim			100			100
Oz			36			36
Upl			100			100
Miss						–
No						–
Amer		13	3	35	7	58
Bott		22	5	60	12	99
Miss			4	28	4	42
So		14	10	67	10	101
Mo			1			1
Bott			100			100
Total		20	91	104	16	231
		9	39	45	7	100

APPENDIX 5

SITE (COMPONENT) FREQUENCIES

PHYSICAL REGION BY TOPOGRAPHY BY FUNCTION

Ill Upl		Workshop	Quarry	Cave/Shelter	Camp	Farmstead	Village	Burial Area
	Bottom				24		17	
	Bl Face		1	4	3		1	1
	Bl Summ				17		18	11
	Int Hl Slo				15		2	
	Int Hl Sum				235		62	
	Bord Upl				9		3	2
	Int Upl						3	
	Int Bl Sum						2	1
Mo Upl								
	Bottom	2			11	1	27	4
	Hi Terr						3	1
	Bl Sum				1		24	1
	Int Hl Slo				9		23	2
	Int Hl Sum				17			2
	Bord Upl				3		3	
	Int Upl				4		2	
Oz Rim								
	Bottom	9	1		20		43	2
	Hi Terr						6	1
	Bl Face			9				
	Bl Sum						6	5
	Int Hl Slo	3	23	6	14		16	1
	Int Hl Sum				8		5	2
	Bord Upl						2	
	Int Upl	4	10					
	Int Bl Face			17				
	Int Bl Sum				1			1

APPENDIX 5 - CONT.

Oz Upl		Workshop	Quarry	Cave/Shelter	Camp	Farmstead	Village	Burial Area
	Bottom	3			48		57	3
	Hi Terr				3			
	Bl Face			1				
	Bl Sum				3		4	4
	Int Hl Slo		1	4	19		33	2
	Int Hl Sum				1		13	
	Bord Upl						7	
	Int Bl Face			49	1		1	
	Int Bl Sum				4		4	1
Miss No								
	Bottom						4	2
Amer Bott								
	Bottom	1			60		89	1
	Hi Terr				6		4	
	Tal Slo				4		10	
Miss So								
	Bottom	2			37	12	86	2
	Hi Terr						7	
	Tal Slo				1		1	
Mo Bott								
	Bottom				3		3	1
	Hi Terr						3	
Total		24	36	90	581	13	600	53